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HOOKER'S

JOURNAL OF BOTANY

AND

KEW GARDEN MISCELLANY.

EDITED BY

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VOL. IX.

MISSOURI
BOTANICAL
GARDEN.

LONDON:

LOVELL REEVE, HENRIETTA STREET, COVENT GARDEN.

1857.

JOHN EDWARD TAYLOR, PRINTER,
LITTLE QUEEN STREET, LINCOLN'S INN FIELDS.

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The Banda Nutmeg Plantations; *by* T. Oxley, Esq., B.A., Senior Surgeon of the Straits Settlement.

(*Extracted from the 'Journal of the Indian Archipelago and Eastern Asia.'*)

That small yet important cluster of islands, long. 130 E. and lat. 4° 30′ N., known as the Banda group, consists of three large and seven small islets, many of which are only little rocky points jutting from the sea. Those devoted to Nutmeg culture are three in number, and called the Great Banda, Banda Neira, and Pulo Aai. All lie very close together. One, named Gunong Api, is a lofty volcanic cone, divided by a very narrow, shallow channel, difficult to be traversed, from the Great Banda and Banda Neira. The crater is incrusted with ashes, which stretch down to the water's edge on the western side of Gunong Api, and only a few trees, shrubs, and small huts are discernible on the eastern side. The Island of Great Banda is far from attractive at first sight: you see along the shore the neat picturesque cottages of Parkineers, or Nutmeg-growers; the rest looks like mere jungle, till closer investigation reveals its marvellous beauties. Banda Neira, again, impresses you unfavourably: its unroofed and dilapidated houses, ruined by the terrible earthquake of 1852, give it the aspect of utter desolation; yet never in any spot of the East have I met with such lovely scenery as the Banda Islands present.

The one-storied houses, which stretch near the seashore, are very solidly walled, but lightly roofed, in order to resist earthquakes, and each has a small Bungalow at the rear, for refuge during these tremendous visitations. The bungalows have strong foundation-walls, three feet thick, on which the light structure, composed generally of the leaf-stems of the Sago Palm, is reared. The last severe earthquake in 1852 levelled almost every dwelling in Banda and Neira, destroyed the drying-houses of the Parkineers, and unroofed the church, since which time only slight undulations have occurred. Besides the chance of being buried under the ruins of their houses, the people of the Banda group are in constant peril of sharing the fate of Herculaneum and Pompeii; for Gunong Api, with its crater, nearly 2000 feet above them, is only a few hundred yards distant, and, by frequent puffs of smoke from its numerous craters, gives constant warning that its slumbering fires may, at any moment, rush into dreadful activity. This volcano is placed on the most active part of the Great Volcano Belt, which, commencing in Kamtchatka, stretches through the Philippines, Celebes, Java, Sumatra, etc., to the Bay of Bengal. It is to be hoped, however, that the subterranean fires, having found a vent in the late dreadful eruption in the Sangir Islands, north of Menado, when 2800 lives were lost, may remain tranquil for awhile, and thus Banda will enjoy temporary safety. The island of Neira would be secured from a torrent of lava by the intervening strait, but a shower of ashes might instantly destroy the whole place. The soil and rocks of these islands, formed of successive layers of pumice and basalt, sufficiently show their origin.

On the three islands which I have mentioned, there are, in all, thirty-four Parks, containing 320,000 bearing Nutmeg-trees, and their total produce last year was 4030 piculs of Nutmeg and 1008 of Mace. This gives little more than one catty and a half of spice to each tree, but many causes diminish the produce: the height of the trees makes much of the fruit inaccessible; some trees grow in places of difficult access; and the wind blows down the nutmegs in such quantities, that I have seen hundreds of thousands strewn on the ground and ruined. A large kind of pigeon feeds extensively on the fruit, rejecting the kernel after digesting the Mace; and field-rats devour the nuts, etc. Altogether, the losses are very considerable.

The Nutmeg-parks or plantations are private property, and can be sold or bequeathed by the owner. Great Banda contains twenty-five,

Neira three, and Pulo Aai six (thirty-four in all). Government has a monopoly of the spice, at a fixed rate; and though this be low, the Parkineers have many privileges. One of these is, that the labour is chiefly done by convicts, of whom Government furnishes 2500, paying them a rupee and a half a month, with gratis medical care; while the Parkineer supplies them with rice and two suits of clothes yearly. Again, rice is sold to the Nutmeg-growers at half-price, and they obtain gratis building-materials and implements from the Government stores. Without such aid the spice crop must cease, for there is no native population in Banda to do the work. Four overseers and sixteen park-rangers are employed by Government to see that the convict-labourers are well treated, and that no smuggling goes on; also to report the state of the plantations, the trees that die, those which are planted, and all particulars of the produce.

Of these thirty-four plantations, I visited all those on Great Banda and Neira, that is, twenty-eight, and was charmed with the lovely scenery and magnificent prospects which many of them command. The former island is a mountainous ridge, rising above the ocean to the height of 1500 feet at the east end, sloping more gradually to the west; the summit consists of undulating plateaux, with no table-land. In many places the ground is precipitous and quite inaccessible: over the more practicable portions of the island are carried artificial staircases, in some instances quite perpendicular. We travelled up and down these in chairs, each borne by ten men; and a most giddy and perilous journey did it seem; for it is indispensable in descending to hold fast by the arms, with the feet resting on a cross-bar, else the rider may be hurled over the bearers' heads, where hundreds of feet yawn right below; while in ascending you are carried horizontally, with the face upward to the sky. The scenery, when you have courage to look round, is enchanting,—the cool shade, varying views, and freedom from entangling jungle, are peculiar and delightful. Underfoot is a carpet of short grass, Mosses, Ferns, and Lycopodiums; for to keep the vegetation short under the Nutmeg-trees is the sole approach to cultivation. No manure is used: the only attempt at planting is to stick in a growing nutmeg wherever a vacancy exists, without regularity, so that often clumps of the trees are seen together, 10 to 12 feet apart, 50 to 60 feet high, and their stems unbranched for 15 or 20 feet above the ground. Clear rills of pure refreshing water rush down the steep ravines, their sound min-

gling with the notes of two kinds of pigeons; while all along the south and eastern parts of the island the sea breaks in high and loud waves on the iron-bound coast, sending its injurious spray for many hundred yards over the Nutmeg-parks.

Some of the Parkineers' houses are comfortable, and many are beautifully situated. The owners are mostly natives of Banda, wedded to their own ways and averse to improvement; though the example of a German gentleman, named Brandes, who has in three years doubled the return of his Spice-trees, might stimulate them to adopt some of his innovations. But in fact the Nutmeg-tree cannot properly be said to be cultivated at Banda: the nuts are merely collected, and have an equally good right to be admitted to the English market, on the low rate of duty, as is accorded to the long-shaped sort from Ceram and Papua. Both are the wild, indigenous productions of the localities; and while it is inconsistent to make any difference in the rate of duty, it is highly injudicious thus to favour the export of an inferior article, which is not only a less aromatic spice, but, from its astringency, even an unwholesome one.

The true Nutmeg has always occupied its present position in Banda, having been found there, on the discovery of these islands by the Portuguese, in 1511. There is no fear that it will ever be eradicated: the wild pigeons will disseminate it, without the help of man. It is the type of the genus; and as all varieties of it are abnormal, I shall point out the differences between it and the Nutmeg of Ceram (commonly called the Nutmeg from the Straits). The latter tree attains a much less height, and is a mere shrub compared with the Banda Nutmeg-tree, which is commonly fifty feet high and sometimes seventy. The produce is much larger in quantity, relatively to the size of the tree, in Banda than the Straits: the nuts are more uniform in size, and nearer to a spherical form, heavier, and containing more essential oil. A curious variety exists: a few trees always bearing ivory-coloured instead of red Mace. The Nutmeg-tree begins to bear at eight years old; it is in its prime at twenty-five years old, and continues fruitful till sixty or older.

The method of collecting the nuts in Banda is to rear small oval baskets, made of Bamboo, upon long poles, among the fruit-bearing branches; each basket is equipped with a couple of small prongs, projecting from the top: these prongs seize the fruit-stalk, when a gentle

pull detaches the nut, and causes it to drop into the little open basket, which contains only three or four Nutmegs. Thus the Mace escapes the injury which it receives by contact with the ground; and there is no hunting for the fallen fruit. In the Straits, no pains are taken to gather the Nutmegs: they are picked up as they drop: many are lost, and all more or less damaged. The mode of breaking them is better too: at Banda the nuts are spread on a sort of drumhead and struck with a flat piece of board, which disengages many kernels at one stroke; after which they are carefully stripped of the Mace, by detaching the latter with the hand, beginning at the apex; instead of scraping off the Mace with large coarse knives from the base, which breaks and curls the blade of the spice.

The Mace is dried in the sun; but the Nutmegs are smoked by slow fires of wood, for three months, before they are fit for exportation. Mace is of three qualities: it is packed in casks containing about 280 lbs.: a man stands in the cask and presses down the spice, as it is filled in. The nuts are placed in wooden bins, filled with lime and water, which are mixed to the consistency of mortar. There they remain for three months, and are then sorted into three qualities and put in casks, like the Mace. The best Japan Teak is used for the casks, of which there is a regular manufactory. The refuse nuts are ground to powder, and converted into what is called *Nutmeg Soap*, by steaming them over large cauldrons for six hours: the warm mass is then subjected to strong pressure, when a brown fluid runs out, which cools to a saponaceous appearance, and, under the name of Nutmeg Soap, is stated to be an effectual remedy for chronic rheumatism.

Except Spice, the Banda Isles produce little: Rice and the necessaries of life are imported. The large Canari-trees* yield a sweet esculent nut, which contains much oil. Vines are said to bear abundantly the finest grapes; and the ordinary fruits of the Indian Archipelago all grow there,—as the Durion, Mangosteen, Jack, and many others: but the Nutmeg is so much more valuable, that no importance is attached to the other fruits, and even vegetables for the table are hardly reared. From the observations which I made in Banda, I came to the conclusion, that it is desirable always to obtain seed from thence, for the culture of the valuable Nutmeg. In that group of islands the original and distinctive character and qualities of the Nutmeg are retained:

* *Canarium commune.*

elsewhere the fruit degenerates, becoming more and more inferior at every remove from the parent stock. The Banda-tree is also much longer-lived than the Nutmeg-tree of the Straits: one tree, brought from Banda to Malacca, is supposed to be more than seventy years old, and it still bears abundance of fruit: its nuts are perfect and uniform, quite different from the long and ill-shaped ones, which are seen in the Straits.

It is to be hoped that the Planters of the Straits will avail themselves of the liberality of the Netherlands Government, which concedes to them the privilege of obtaining fresh seed.

Sketch of the Life and Writings of M. DE MARTIUS, Secretary to the Bavarian Academy of Science; *by* ALPHONSE DE CANDOLLE.

(*Continued from* vol. viii. p. 369.)

But the work with which Martius has specially identified himself, and which best displayed his taste and ability, and upon which he most exclusively worked, and which he completed after twenty-eight years' labour, is the 'Natural History of Palms.' This noble publication is in three large folio volumes, which contain 245 plates, chiefly coloured, some being landscapes, which exemplify the general aspect of the living Palms. The noble growth of these trees, utterly different from, and often far overtopping, their companions, had evidently captivated Martius, as they did Linnæus, who styled them the Princes of the Vegetable Kingdom. Far from numerous is this aristocratic family: it contains only 600 species; but in no part of the world is it more amply represented than in Brazil, nor had it ever been so closely studied as by our author.

The 'History of Palms' is entirely written in Latin; the style is elegant and clear; the subdivisions, tables, and figures materially facilitate research. The first volume treats of Palms in general, and commences by Mohl's chapter on their anatomy, whereon he founds excellent remarks on the organization of Monocotyledons, which was little known for want of good specimens. Moldenhauer and Desfontaines had established certain points, but others were undefined. Martius rendered a prodigious service to science by furnishing M. Mohl with numerous fragments of various Palms, and consigning them to his in-

vestigation. The second chapter, by M. Unger, is upon Fossil Palms; and in the third Martius takes up the pen and pursues the subject to the close, by describing the formation of the various organs, from the root to the inflorescence and fruit. In discussing the stem, M. Mohl's remarks are confirmed; while the convolution and display of the fibres, combined with the leaves, to which they extend, are treated in a thoroughly scientific and masterly style. Various tables of figures exhibit the rate of increase in the trunks of several kinds, both in height and girth, the annual number of their leaves, and the distance between these leaves. It is the opinion of M. de Martius, that the unbranched Palms, in general, do not attain a great age,—not more than three centuries: while Dicotyledonous trees occasionally live for thousands of years, and die by accident. The ramified Palms, such as the *Doum* of Egypt, which is almost the only instance of this growth among the Tribe, are probably much longer-lived than the others, and this seems only natural, as each branch issues from a new bud; while, in the normal state of these trees, the same terminal shoot is continued and becomes exhausted as it rises farther and farther from the roots.

The formation of leaves, and their relative arrangements, are carefully treated; and numerous observations exhibit the varieties which take place in each species. In most botanical treatises it is customary to judge of the foliage and its arrangement by the examination of one part of a stem; while M. de Martius asserts that the *Date Palm* has all the following dispositions of the leaves:—$\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{13}$, $\frac{8}{24}$; the *Chamædorea Schiedeana* $\frac{2}{5}$, $\frac{3}{8}$, etc. Again, the arrangement of the floral leaves, termed spathas, often varies; and it differs from that of common foliage, adhering however to the mathematical rule of the spiral, as the above-mentioned figures plainly prove. The parts of the flower are equally closely studied. In all these respects, the work in question is on a level with the most recent observations; though the plates in the first volume have been published these many years. The development of the whorls of flowers in the Palms is normal,—that is, from the exterior to the interior; still, the three ovules precede the ovaries, which is not an unimportant fact, whether in itself, or as bearing on the theory of the origin of ovules. As for the relative situation of the floral parts, and of the bracteas or bractlets which surround it: the subject is one in which M. de Martius delights, and of which he gives numerous figures and details in this work, unequalled, I believe, by any Monograph.

The geographical distribution of Palms is not particularly interesting, as these trees are almost equally diffused throughout the Tropics. More than half are found within the first ten degrees of latitude, above and below the equator. Of the 582 known species, 307 inhabit the Old World, and 275 the New. M. Martius takes the opportunity to append a map of fifty-one regions, into which he divides the whole world, as regards its Botany; and in another map, adorned with allegorical designs, he exhibits the distribution of Palms, in about half these regions, with deeper and paler tints, according to the greater or less number of the species. In reference to the distribution of seeds, he discusses the probable origin of the Cocoa-nut Palm (*Cocos nucifera*), and shows that the islands of Western Equatorial America, and especially those islets termed the Cocos group, are probably the starting-point of a tree which had been deemed of Asiatic origin. I have myself adopted this opinion, and support it by new reasons in my most recent work upon Botanical Geography. The second volume is devoted to a detailed description of the Brazilian species. In the third the author considers the whole Family, its characters, synonyms, the locality and habits of every species, genus, and division of Palms. A more complete monograph hardly exists. The observations on certain remarkable species, as the Palmetto (*Chamærops humilis*), the Date (*Phœnix dactylifera*), are extensive, learned, and interesting.

These large and important publications on descriptive Botany did not seem to satisfy Martius completely; and they certainly have their drawbacks, in the tardy progress which is inseparable from their heavy expense and numerous plates; besides their being restricted to certain genera and families. It was, no doubt, in M. de Martius' option to select the most novel and interesting kinds; but while thus occupied, the majority of his plants remained unexamined in the herbarium: and other botanists were engaged in publishing the plants of Brazil. M. de Martius accordingly began a Flora, in octavo, of all Brazilian species, consisting of descriptions, without plates, and comprising not only his own discoveries, but the Herbaria of Sellow and of the Prince of Neuwied, and other travellers. The second volume, which related to the Grasses, was promptly and ably edited by Nees von Esenbeck, and included a chapter by Martius on the distribution of the *Gramineæ* in Brazil, and remarks on their economic uses, principally on the origin, cultivation, and employment of the Sugar-cane. The first volume, on

the *Cryptogamia*, did not appear till some years after the first; it is by MM. Martius, Nees, and Eschweiler.

I am ignorant of the reason why this octavo publication was discontinued; but only the above-mentioned two volumes ever appeared, and M. de Martius speedily commenced a work, on a more enlarged plan, which united its advantages with those of the 'Nova Genera.' I allude to the 'Flora Brasiliensis,' in folio, edited by different authors, published originally under the superintendence of Martius and Endlicher, and then, on the death of the latter, by Martius alone, now aided by M. Fenzl. It is patronized by the two Sovereigns of Austria and Bavaria. Fifteen numbers of this splendid work have already appeared, each containing all the Brazilian species of one family, as derived from the united collections of Pohl, Martius, Sellow, Neuwied, Riedel, Lund, etc., which are deposited in the Museums of Germany. It is to be regretted that the plants of Bahia, gathered by Blanchet, and those of Gardner, both purchasable at the time, were not added from the beginning of the book; but in the later Fasciculi the range is extended, and the 'Flora of Brazil' now contains, pretty nearly, all the species that are known to grow there. The Herbarium of Auguste de St.-Hilaire, long guarded with as much strict jealousy as the sacred Virgins of the Sun, but now open to public acquisition by the owner's death, will probably augment, if permitted by the Museum of Paris, the riches of the most extensive Flora which ever was attempted.

M. de Martius has not restricted himself to a methodical order in the Families, but sometimes occupies himself with one or other monograph, bearing on Brazilian Botany. The vast extent of Brazil, and its striking wealth in plants, cause each such Essay to be nearly a complete account of the Tribe in question. This may be particularly said of the *Anonaceæ* by Martius himself, the Mosses by Hornschuch, the *Cyperaceæ* and *Acanthaceæ* by Nees, the *Smilaceæ* and *Dioscoreæ* by Grisebach, several smaller families of Monocotyledons by Seubert, the *Solanaceæ* by Sendtner, the *Verbenaceæ* by Schauer, the *Piperaceæ* and *Urticeæ* by Miquel, the *Podostemoneæ* by Tulasne, the *Polygoneæ*, *Thymeleæ*, and *Proteaceæ* by Meisner. These authors are frequently the same as have treated these very families in the 'Prodromus;' for which reason, the plates and descriptions of the Flora explain the Prodromus, and the latter is a brief summary, in which the Brazilian species are better harmonized with those of other lands. Science profits by this

simultaneous proceeding, and the more, as the same divisions and names being published in the two works, an increased notoriety is the consequence, and they mutually confirm and give authority to each other.

The 'Flora of Brazil' contains, besides purely botanical descriptions and plates, some very interesting articles, by M. Martius, on the vegetation of different parts of that empire, with lithographed plates, which aptly illustrate the features of the principal regions, and the more striking spots. Latin is not ill-suited for describing a country, remarkable for the plants which are named in that language: and when this learned tongue is managed by an author who loves it and who uses it without pedantry, we come to look back with regret to the period when this universal language prevailed in science.

(To be continued.)

Notes on the HERBARIUM *of the* CALCUTTA BOTANIC GARDEN, *with especial reference to the completion of the* FLORA INDICA; *by* THOMAS THOMSON, M.D., F.R.S., Supt. H. C. Bot. Garden.

(Read before the Asiatic Society of Calcutta.)

It is probably known to all the members of the Asiatic Society who are interested in the science of Botany, that Dr. Hooker and myself have undertaken the publication of a complete work on Indian plants, the first volume of which, under the title of 'Flora Indica,' was published last year. The continuation and completion of this work is of the utmost importance to the advancement of Indian Botany, which is much retarded by the want of a properly digested catalogue. The further progress of the work will however in a great measure depend on the co-operation of botanists throughout India, the materials here, though extensive, being too incomplete, to enable me to advance without further contributions.

I bring this subject before the Asiatic Society therefore with a double object. I wish in the first place to make known the nature and extent of the Herbarium belonging to the Garden; and in the second, by means of the Society and the Journal, to bring to the knowledge of botanists in all parts of India the assistance which it is in their power to render, in furthering the progress of a work, the object of which is to render available to the student of Indian plants information scattered over a thousand detached works, and therefore only accessible to the professional botanist.

The Calcutta Botanic Garden is associated almost with the commencement of modern Indian Botany. The classic work of old Rheede, who, two centuries ago, illustrated a series of drawings, often remarkable for their fidelity, by a condensation of all the facts obtainable from the most intelligent Brahmins of Malabar, belongs to a former epoch, and stands alone. It was for many years almost the only source from which botanists could know Indian plants, and even now we have in many cases to refer to its plates instead of to nature for the types of the genera of the older botanists.

Modern Indian Botany began with the Danish missionaries of Southern India, who were attracted to the science, in the first instance, by the benevolent wish to combine the practice of the healing art with the duties to which they had devoted themselves. This motive actuated the whole body, but a few continued to prosecute the science for its own sake, and some of the medical officers of the Madras Presidency formed with them a botanical association, by which plants were examined and named, and to which the discoveries made by members at a distance were reported. One of the most distinguished of these associates was William Roxburgh, who was appointed in 1794, on the death of Colonel Kyd, the Superintendent of the Calcutta Botanic Garden, and commenced at once the labours which have gained for him a position at the head of Indian Botany, of which indeed, as the author of the first Flora, he may, in one sense, be said to be the founder.

During a long series of years Roxburgh examined, described, and prepared drawings of the indigenous plants of India. In all possible cases he cultivated them in the garden under his own eye and examined them carefully in all stages of growth. The descriptions, which are remarkable for their accuracy, by degrees took the shape of a Flora Indica, comprising all the plants of the Northern Circars (in which Roxburgh resided before he came to Bengal), those of Bengal proper, and such of the plants of Silhet and Chittagong as were introduced by active collectors into the Gardens and flowered there. It is therefore a nearly complete Flora of the plains of India from the base of the Himalaya to Cape Comorin, and contains descriptions of most of the plants which a botanist will meet with in the neighbourhood of the presidency towns or the large stations.

The drawings, more than 2000 in number, were made in duplicate. One set is in the Garden Library, the other, with corresponding numbers,

is in the India House. A selection of 300 of the more remarkable forms was published in England by Sir Joseph Banks, at the expense of the Court of Directors, and outlines of many others have been introduced by Dr. Wight into his 'Icones Plantarum.' The species described by Dr. Roxburgh in the 'Flora Indica' can, in general, be readily determined from these drawings, so that there is less occasion than might have been expected to regret the absence of dried specimens. Dr. Roxburgh probably collected largely. He certainly transmitted considerable collections to scientific bodies in Europe, but most of these have been dispersed; there are however a considerable number of his specimens in the British Museum, at the Linnean Society, and the University of Edinburgh.

Dr. Roxburgh was succeeded at the Botanic Garden by Dr. Francis Buchanan, afterwards Hamilton, a man to whom extensive travel had given great knowledge of India. In the Peninsula he had explored the Carnatic, Mysore, Malabar, and Canara, and in Bengal, the Rajmahal Hills, and the whole of the northern and eastern districts, as far as Assam and Tippera. He had also visited Nipal. The botanical results of these journeys have been unfortunately, in a great measure, lost, but many important facts are recorded in his commentaries on the 'Hortus Malabaricus' of Rheede, and the 'Herbarium Amboynense' of Rumph, two memoirs in which Hamilton has embodied a great deal of valuable information on Indian Botany. His collections form part of the Herbarium of the University of Edinburgh.

In 1815 the Botanic Garden came into the hands of Dr. Wallich, an ardent and enthusiastic botanist, under whom Indian Botany continued to progress rapidly. The labours of Roxburgh had completed the flora of the plains of India, though the work remained still in MSS. Dr. Wallich took a wider range. Our recent war in Nipal having resulted in the appointment of a Resident at the Court of Katmandú, Wallich joined Mr. Gardner there, and collected assiduously for more than a year in the vicinity of the capital. The interior was then, as now, jealously closed against European travellers, but by means of native collectors he added a fair knowledge of the alpine flora to the abundant information regarding that of the temperate and tropical regions, which he obtained by his personal exertions.

Dr. Wallich's duties at the Gardens not permitting him to prolong his residence at Katmandú indefinitely, he trained a number of col-

lectors, who continued, during a long series of years, to transmit dried specimens from Nipal. Mr. Blinkworth, an active collector, at the same time explored Kumaon, and Mr. Gomez contributed extensive collections from the rich province of Silhet, and from the neighbouring Khasia hills, while Wallich himself visited Penang and Singapore, thus adding a knowledge of the Malayan Flora to that of the rest of India.

Abundant materials for the elucidation of the Botany of India having thus been brought together, it became a question in what manner they might be disposed of to most advantage. Dr. Wallich at one time entertained the idea of incorporating them into an Indian Flora, and with this object he commenced the publication of an edition of Roxburgh's 'Flora,' into which all his own discoveries were introduced. As his collections accumulated, this task became every day more difficult, and his other duties, and in particular the state of his health, rendered its progress extremely slow, and at last compelled him to stop, after publishing two volumes, which extend as far as the end of *Pentandria Monogynia* in the Linnean arrangement, and include therefore the first volume of the ordinary edition of Roxburgh, or less than one-third of the whole work.

Dr. Wallich then determined to return to England with all his collections, and with the consent of the Court of Directors, which was at once liberally accorded, to distribute amongst scientific men, in all parts of Europe, the materials which he had accumulated, but could not hope to have leisure to work into shape, in the hope that each recipient would be able to lend his aid to the study of some part, so that by the joint labour of all, the Indian Flora might be benefited and furthered. The result has been satisfactory. The dispersion of the Wallichian Herbarium over all parts of Europe, enabled students of Botany everywhere to obtain access to a set of these specimens, and monographers have, in describing them, uniformly quoted the numbers attached to the specimens. The Wallichian Herbarium has therefore become one of the foundations of Indian Botany, and it is a source of regret to me that a set of its specimens does not form a part of our collection here. Steps have recently been taken which will, I hope, remedy the deficiency, as several duplicate sets still exist in the Linnean Society's collection.

Those only can appreciate the difficulties with which Dr. Wallich had to contend in this distribution, who have had much practice in the

arrangement of dried plants, and are familiar with the irksome task of assorting the miscellaneous collections sent in by numerous collectors, variously ticketed, and often in great confusion. A quick eye and a ready hand bring the species together, but constant watchfulness is even more essential, in order to prevent errors in localities, the greatest evil to which we are exposed in arranging large collections. It is therefore not at all surprising that Dr. Wallich should have occupied four years in this task, and yet been compelled to return to India before it was completed.

Between 1815 and 1828 a large and valuable series of botanical drawings was prepared under Dr. Wallich's superintendence. These he took to England with him, and they are deposited at the India House, but as no copies were made, we do not, as in the case of the Roxburghian drawings, possess a corresponding set. From among these drawings, Dr. Wallich selected 300 of the most interesting, which were published under the title of 'Plantæ Asiaticæ Rariores,' a superb work, alike honourable to the Court and to the author.

(*To be continued.*)

NOVA GENERA *et* SPECIES *aliquot rariores in Plagis* AUSTRALIÆ INTRATROPICIS *nuperrime detecta, exposuit* DR. F. MUELLER.

(*Continuation of Notes on North Australian Botany, by Dr. F. Mueller, from* vol. viii. p. 331.)

THALAMIFLORÆ.

BOMBACEÆ.

Adansonia *Gregorii;* foliolis 4–9 petiolulo orbatis subtus cano-velutinis, calyce in lacinias 2–4 fere basi tenus rumpente, pedunculis rectis, petalis 5 raro paucioribus oblongo-cuneatis in basin longe angustatis liberis, stylo stamina demum paulo excedente recto basin versus dense tomentoso, antheris subcordatis, stigmatibus 5–8 barbatis, capsula ovata vel pyriformi exsulca.

HAB. In planitiebus orariis et ripariis ad flumina Victoria et Fitzmaurice, ad promontorium Point Pearce alibique.

Gouty-stem Tree, *All. Cunn. in King's Survey, App. p.* 25. *Stokes, Discov. in Australia.*

Cochlospermeæ.

Cochlospermum *heteronemum;* arborescens, foliis reniformi-cordatis sinuato-3–5-lobulatis utrinque cum petiolis pedunculis ramulisque velutinis, filamentis seriei extimæ inferioribus 7–11 declinatis subulatis, ceteris capillari-filiformibus.

Hab. In collibus planitiebusque siccis præsertim lapidosis, ad flumen Victoria, in tractu M'Adam's Range aliisque locis.

Bombax sp., *Stokes, Disc. in Austr.* Cochlospermum Gossypium, *Leichhardt, Overland Expedition, passim.*

Capparideæ.

Roeperia, n. g.—*Sepala* 4, lanceolato-linearia, longe acuminata, decidua, posticum columnam suffulciens. *Petala* 4, imo toro inserta, elongato-oblonga, unguiculata, unilateraliter versa, integerrima, decidua, 2 exteriora angustiora. *Stamina* 5 vel 7. *Filamenta* unilateralia, inferne inter se et cum stipite germinis connata, superne libera, interiora longiora, altius connata. *Antheræ* biloculares, basifixæ, mox revolutæ, deciduæ, loculis longitudinaliter dehiscentibus. *Germen* longe stipatum, uniloculare. *Gemmulæ* juxta placentas intervalvulares geminas numerosæ, amphitropæ. *Stylus* filiformis, elongatus. *Stigma* minutum, semiglobosum. *Capsula* siliquæformis, longe stipata, unilocularis, bivalvis, valvis a replo persistente seminifero secedentibus. *Semina* numerosa, reniformi-ovata, transverse rugosa, *strophiolo* inferne hippocrepico superne compresso semiamplexa, exalbuminosa. *Cotyledones* incumbentes.—Herba *Australiæ intratropicæ annua, glandulosa,* Cleomis *facie;* foliis 3–5-*foliolatis, exstipulatis,* foliolis *angusto-lanceolatis integerrimis;* pedunculis *axillaribus et terminalibus, solitariis, unifloris;* corollis *magnis, luteis.*—Genus ad *Gynandropsin* accedens, *Roeperam,* Adr. Juss., ad *Zygophyllum* retuli in 'Linnæa,' xxv. p. 374.

R. *cleomoides.*

Hab. In plaga elevata arenoso-rupestri secus partes fluvii Victoriæ necnon Wickhami australiores.

Buettneriaceæ.

Seringia *nephrosperma;* foliis cordato- vel oblongo-ovatis obtusis supra velutinis glabrescentibus subtus tomentosis repandis vel subsinuatis,

calycis 4–5-partiti lobis subcordatis obtusissimis, petalis nullis, filamentis germen vix æquantibus, carpidiis 1–2-spermis apteris, seminibus reniformibus lævibus strophiolo perminuto præditis, embryone hemicyclico.

HAB. In eremo pone originem fluvii Victoriæ sicut juxta rivum Sturt's Creek.

CALYCIFLORÆ.

PORTULACEÆ.

TRIGASTROTHECA, n. g.—*Sepala* 5, persistentia, mutica, margine membranacea, æstivatione imbricata. *Petala* nulla. *Stamina* 4–5, hypogyna. *Filamenta* e lata basi lineari-subulata, libera, sepalis alterna. *Antheræ* ovatæ, dorso insertæ, biloculares, loculis longitudinaliter dehiscentibus. *Discus hypogynus* nullus. *Germen* triloculare, liberum, loculis bi-tri-gemmulatis. *Gemmulæ* funiculis brevissimis angulo centrali affixæ. *Styli* 3, filiformes. *Capsula* membranacea, trigastra, apice triloba, trilocularis, indehiscens, irregulariter rumpens, leviter inflata, loculis 1–2-spermis. *Semina* reniformia; *testa* crustacea, granulata. *Embryo* hippocrepicus, *albumen* farinaceum fere omnino cingens.—Herba *Australiæ centralis glabra, dichotoma;* foliis *linearibus oppositis vel pseudo-verticillatis;* floribus *umbellatis.*—Genus *Mollugini* cognatum.

T. *molluginea.*

HAB. In planitiebus apricis præsertim subsalinis ad rivum Sturt's Creek.

EUPHORBIACEÆ.

PETALOSTIGMA, n. g.—*Flores* dioici, apetali.—MAS. *Sepala* 4–6, imbricata, exteriora ovata, interiora longiora suborbicularia. *Filamenta* numerosa, in columnam conico-cylindraceam villoso-tomentosam coalita. *Antheræ* biloculares, oblongæ, basi emarginata insertæ, loculis connectivo breviter excurrente omnino adnatis longitudinaliter dehiscentibus.—FŒM. *Sepala* 6, in tubulum conniventia, imbricata, exteriora lanceolata interioribus ovatis acuminatis longiora. *Stylus* trifidus. *Stigmata* petaloidea, obcordato-cuneata, erosa, crispata. *Drupa* subglobosa, 8- raro 6-costulata, cetera lævis, 4- raro 3-locularis. *Pericarpium* carnosum, demum secedens. *Putamen* dempto pericarpio loculicide 4- raro 3-valvatum, valvis osseis longi-

tudinaliter septicide dissilientibus. *Semina* in loculis bina, abortu solitaria, pendula, strophiolata.—Frutex *vel* arbuscula *Australiæ tropicæ, non lactescens;* foliis *alternis, subcoriaceis, ovatis vel suborbiculatis, integerrimis, subtus sericeis, denique tomentellis;* floribus *axillaribus,* masculis *umbellatis,* fœmineis *solitariis;* drupis *nauseoso-amaris, rufis, Dromaiæ Novæ-Hollandiæ jucundis.*—Genus distinctissimum *Elateriospermo* et *Ostode* aliquot notis propinquum, aliis præsertim fructu tetramero ad *Plukenetiam* approximans.

P. *quadriloculare.*

Hab. Frequens in tractu steriliore tam littorali quam interiore Australiæ borealis.

Severn-tree, *Leichhardt's Overland Expedition, passim.*

Elachocroton, n. g.—*Flores* monoici, apetali, bracteolati, glandulis duabus suffulti. *Masculi* spicati, 3-sepali; *filamenta* sepalis alterna, libera. *Antheræ* reniformi-cordatæ, loculis parallelis poro infra-apicali apertis. *Flores fœminei* ad basin spicæ masculæ solitarii, pedicellati. *Sepala* 3. *Capsula* tricocca, coccis dorso bifarie echinulato-tuberculatis monospermis. *Semina* pendula, strophiolata.—Herba *Australiæ tropicæ;* foliis *alternis stipulatis lanceolatis serrulato-scabris; spicis terminalibus gracillimis.*—Genus *Microstachyæ* affine.

E. *asperococcum.*

Hab. In locis sterilioribus ad flumen Victoriæ.

Leptonema *melanthesioides;* fruticosum, glabrum, foliis ovatis petiolo multoties longioribus integerrimis vel subrepandis, umbellis dioicis sessilibus multifloris, pedicellis bracteolas pluries superantibus, floribus 5-sepalis, masculis pentandris, stylo sterili bipartito, fœmineis trigynis, capsula depresso-globosa tricocca.

Hab. Secus flumen Victoriæ frequens.

Myrtaceæ.

Xanthostemon, n. g.—*Flores* umbelluloso-corymbosi. *Calycis tubus* ecostatus, hemisphæricus, basi cum germine connatus, limbus superus 5-partitus, laciniis persistentibus deltoideo-lanceolatis acutiusculis. *Corollæ petala* 5, calycis laciniis alterna, annulo perigyno staminifero extus inserta, decidua. *Stamina* 15–19, uniseriata, omnia fertilia, libera. *Filamenta* longe exserta, filiformia. *Antheræ* ovato-cordatæ, basifixæ, loculis longitudinaliter dehiscentibus, connectivo glandulaceo dorso incrassatæ. *Stylus* stamina paulo superans, fili-

formis. *Stigma* simplex. *Germen* inferne calyci adnatum, superne liberum. *Capsula* chartacea, calyce soluto libera, fere supera!, globosa, pericarpio sicco corticata, bi-tricocca. *Pericarpium* secedens, demum in valvas coccis alternas medio dissepimentum obliteratum gerentes rumpens. *Cocci* loculicide bivalves, polyspermi. PLACENTÆ axillares. *Semina* compressa, angulata, aptera.—Arbor; foliis *in apice ramulorum opposite confertis, ovatis, minutim glandulosis, penninerviis, reticulato-venulosis,* umbellulis *corymbosis terminalibus, pedicellis basi bibracteolatis,* staminibus *aureis.*—Genus *Meterosidero* proximum.

X. *paradoxus.*

HAB. In collibus petræis ad flumina Victoria et Fitzmaurice.

UMBELLIFERÆ.

HEMICARPUS, n. g.—*Flores* hermaphroditi. *Calycis tubus* compressus, limbus inæqualis, in mericarpio fertili subnullis, in sterili dentes duos subulatos jugis lateralibus continuos formans. *Petala* 5, ovata, æqualia, sessilia, apice non inflexa. *Stamina* 5, breviter exserta. *Styli* longiusculi, filiformes, divergentes, basi non incrassati. *Mericarpia* disparia, alterum fertile, oblique ovatum, a latere plano-compressum demum secedens, evittatum, seriato-tuberculatum, 5-jugum; jugis lævibus, commissuralibus crassiusculis, lateralibus tenuioribus curvilineis, dorsali carinam efformante vel alato. *Semen* valde compressum. *Meriocarpium* alterum abortivum, *carpophoro* indiviso adnatum, persistens, diminutum ad clavellam lineari-trigonam tuberculis destitutam stylo persistente terminatam.—Genus *persingulare mericarpio altero obliterato, habitu* Didisco *affinitate quoque* Dimetopiæ *accedens.*

H. *didiscoides;* caulibus glabris, foliis radicalibus 3–5-sectis vel 3–5-fidis, laciniis late cuneatis antice dentatis petiolo parcius hirsutis, foliis caulinis dissectis vel laciniatis, superioribus setaceis præter basin glabris, involucri foliolis 10–16 indivisis glabris pedicellis fructiferis brevioribus, petalis flavidis, mericarpiis pedicello æquilongis, fertili carinato.

HAB. In campis subarenosis ad flumen Victoriæ ostium versus necnon ad montem Providence Hill.

H. *villosus;* dense hirsuto-villosus, foliis inferioribus 3–5-sectis partitisve, laciniis subcuneatis utplurimum bi-trifidis argute et grosse den-

tatis, foliis summis linearibus indivisis acutissimis, involucri foliolis numerosis setaceis pedicellos fructiferos æquantibus, petalis albis, mericarpiis pedicello brevioribus, fertili secus carinam alato.

HAB. In collibus arenoso-rupestribus ad rivum Sturt's Creek rarissimus.

COMPOSITÆ.

DIODONTIUM, n. g.—*Capitulum* 8–10-florum, homogamum, discoideum, *involucri* oligophylli *squamæ* subbiseriatæ, distinctæ, exteriores breviores. *Receptaculum* planiusculum epaleatum. *Flores* omnes hermaphroditi æquales. *Corollæ* tubulosæ 5-dentatæ. *Antheræ* semiexsertæ ecaudatæ. *Stigmata* in appendicem subulatam papilloso-hispidulam desinentia. *Achenia* cuneato-obovata compressa uninervia dorso subconvexa, aristulis 2 divergentibus summo apice retro aculeolatis terminata, ala lutea incurva glabra rigida integerrima aucta.—Frutex *Australiæ borealis interioris gracilis graveolens glaberrimus strictus fastigiato-ramosus*, foliis *oppositis vel fasciculatis filiformibus ;* capitulis *terminalibus solitariis fastigiato-paniculatis ;* floribus *luteis ;* acheniis *lucidis*, involucrum *superantibus.*—Genus e *Verbesinearum* tribu distinctissimum.

D. *filifolium.*

HAB. In collibus graniticis necnon in plaga elevata petræa arenoso-rupestri (sandstone table-land) inter flumen Victoria et Sturt's Creek.

COLEOCOMA, n. g.—*Capitulum* multiflorum, heterogamum. *Involucrum* subovatum, squamis enerviis appresso-imbricatis, exterioribus subrotundis cuspidato-mucronulatis, mediis subovatis antice scariosis, interioribus intimisque oblongis linearibusqne appendicula brevi lacero-denticulata terminatis. *Receptaculum* planum, alveolatum, epaleatum. *Flores* omnes tubulosi, marginales, pauciseriati ; fœminei tenuiores, 3–5-dentati, stylo bifido ; centrales hermaphroditi, steriles 5-dentati, stylo indiviso. *Antheræ* apice obtusæ, basi ecaudatæ. *Filamenta* glabra. *Achenia* florum marginalium angulato-cylindracea glabra, pappo cylindraceo ! apice lacero corollam longiorem vaginante. *Pappi* florum centralium *paleæ* 8–10 angusto-lineares serrato-scabridæ apicem versus paulo dilatatæ, inferne in tubulum connatæ !, corollam æquantes.—Frutex *humilis deserti subsalini Australiæ centralis, dichotomus, glaber*, Centaureæ *facie ;* foliis *lanceolatis argute*

dentatis sessilibus; capitulis *terminalibus alaribusque solitariis sessilibus;* corollis *roseis.*—Genus *Centaurineis* adnumerandum.

C. *Centaurea.*

Hab. In planitiebus subsalinis passim inundatis argillaceis necnon secus ripas rivulorum subsalinorum ad Sturt's Creek.

Leguminosæ.

Oxycladium, n. g.—*Calyx* bilabiatus, basi attenuatus, minute bibracteolatus, labio supero bifido, inferiore longiore tripartito. *Corolla* . . . *Legumen* rhombeo-ovatum, inflatum, stylo persistente subuncinato-rostratum, stipitatum, longitudinaliter secus suturam superam semiseptatum, monospermum. *Semina* estrophiolata, nephroideo-ovata, ope funiculi brevis semisepto affixa.—Frutex *Australiæ tropicæ interioris* Daviesiæ *facie, aphyllus;* ramis *spinescentibus;* pedunculis *lateralibus unifloris solitariis cum basi ramulorum unibracteatis.*

O. *semiseptatum.*

Hab. In plagis elevatis rupestribus inter flumina Victoria River and Sturt's Creek.

Nematophyllum, n. g.—*Calyx* profunde bilabiatus, nudus, labio superiore complicato-lanceolato acuminato indiviso; inferiore vix longiore trifido; laciniis lateralibus lanceolatis acuminatis media longe acutata canaliculata duplo brevioribus. *Vexillum* ovatum, ecallosum, integrum, carinam paululum alas duplo superans, quibuscum breviter unguiculatum. *Alæ* curvato-oblongæ, basi appendiculatæ. *Carinæ* imberbis obtusiusculæ petala inferne soluta, basi auriculata. *Stamina* 10, ultra medium monadelpha, tubo antice fisso. *Antheræ* oblongæ, conformes. *Stylus* glaber, filiformis. *Stigma* minutum, simplex. *Germen* stipatum, pauciovulatum. *Legumina* compressa, unilocularia, dehiscentia, lanceolato-ovata, in stipitem attenuata, 2–3-sperma. *Semina* strophiolata.—Frutex *altior* Australiæ borealis *gracillimus, glabrescens;* foliis *simplicibus, alternis, confertis, cum petiolo longiore filiformibus et subcontinuis subuncinato-mucronulatis, minutim stipulatis;* pedunculis *longis, axillaribus, solitariis, unifloris, subracemosis, apice bibracteolatis;* floribus *breviter crassoque pedicellatis;* corollis *luteis.*—Genus in tribu *Lotearum* insigne, habitu *Dillwyniis* potius simili.

N. *Hookeri.*

Hab. In tractu elevato juxta fluvii Victoriæ partes altiores et secundum rivum Sturt's Creek.

Erythrina *biloba* (Corallodendron); ramulis parce aculeatis teretiusculis apice tomentosis cito glabratis, petiolis inermibus filiformibus, internodio inferiore foliolis longiore, foliolis glabris bipartitis! in petiolulum brevem angustatis, terminali remoto, laciniis foliolorum divergentibus elongatis angusto-oblongis obtusis concoloribus, leguminibus elongato-lanceolatis flexuosis in stipitem angustatis, seminibus reniformi-oblongis ovatisve concolori-coccineis.

HAB. In collibus planitiebusque graniticis prope originem rivi Sturt's Creek. Flores non visi.

COROLLIFLORÆ.

ASPERIFOLIÆ.

LOBOPHYLLUM, n. g.—*Calyx* 4-partitus!, segmentis lanceolatis inæqualibus. *Corolla* infundibularis, tubo brevi, fauce nuda, limbo brevissimo. *Stamina* 4!, tubo corollæ infra medium inserta, inclusa. *Antheræ* subrotundæ, biloculares, inter loculos longitudinaliter dehiscentes affixæ. *Germen* quadrilobum. *Stylus* brevissimus. *Stigma* bipartitum, recurvum. *Nuculæ* 4, per paria cohærentes, uniloculares, monospermæ, areola orbiculari receptaculo minuto affixæ, trigonæ, rostellulatæ, dorso convexæ, angulo centrali acutæ. *Semina* exalbuminosa.—Herba *perennis* Australiæ centralis *humifusa, multicaulis, ramosa;* innovationibus *hirsuto-villosis;* foliis *alternis, subovatis, obtuse crenato-lobatis!, strigulosis;* floribus *axillaribus solitariis ebracteolatis brevissime pedicellatis*, corollis *minimis.*—Genus tam habitu quam characteribus optime limitatum.

L. *tetrandrum.*

HAB. Circum lacunas rivi Sturt's Creek, necnon perraro ad ripas fluvii Victoriæ superioris passim inundatas.

Halgania *solanacea;* suffruticosa, perennis, erecta, pube brevi et hirsutie patente induta vel tomentosa, foliis ovali-oblongis planis integerrimis in basin angustatis apice obtusis, superioribus sessilibus, inferioribus petiolatis, corymbis breviter pedunculatis terminalibus compositis paucifloris, calycis 5-partiti lobis oblongo-linearibus obtusis lacinias corollæ angusto-lanceolatas acutiusculas subæquantibus, capsulæ loculis bilocellatis.

HAB. In erema Australiæ tropicæ originem fluvii Victoriæ versus, sicuti ad flumen Sturt's Creek.

Verbenaceæ.

Newcastelia, n. g.—*Calyx* æqualiter 5-fidus, laciniis triangularibus post anthesin valvatim conniventibus. *Corolla* infundibularis, tubo recto incluso, limbi 5-partiti lobis æqualibus brevibus acuminatis. *Stamina* 5, æqualia, inclusa, corollæ lobis alterna. *Filamenta* brevissima, infra faucem inserta. *Antheræ* dorso affixæ, biloculares, loculis parallelis longitudinaliter dehiscentibus. *Germen* 4-loculare, loculis unigemmulatis. *Stylus* filiformis, breviter exsertus. *Stigma* emarginatum. *Drupa* sicca globosa, calyce arcte obtecta, 4-locularis, 4-sperma, basi foraminulis 2 confluentibus intrusa, axi non hiante. *Semina* erecta, exalbuminosa.—Frutex *eremam* Australiæ australis *inhabitans, hirsutie ramosa tomentosus;* foliis *oppositis, lanceolatis, sessilibus;* spicis *terminalibus, bracteatis, villis* calycis *corollam cæruleam occultantibus.*—Genus illustrissimo et prænobilissimo Duci de Newcastle, sub cujus ministerio expeditio pro plagarum Australiæ interioris exploratione emissa, grata et pia mente tributum, affinitate *Pithyrodiæ* et *Mallophoræ* proxime connexum.

N. *cladotricha.*

Hab. In eremæ virgultis prope partem Australem rivi Sturt's Creek.

MONOCHLAMYDEÆ.

Proteaceæ.

Helicia *Australasica;* arborescens, glabra, foliis tenui-coriaceis lanceolato-ovatis integerrimis vel obscure paucidentatis planis, racemis spicæformibus elongatis aureis cernuis denique nutantibus, glandulis hypogynis liberis, germine tomentoso sessili, stigmate apice truncato.

Hab. Ad rivulorum ripas in vicinitate montium M'Adam's Range.

Folia ut plurimum 2–3″ longa, 1½–2″ lata, basi sæpissime cuneato-contracta, perbreviter petiolata. *Stylus* semiuncialis.

Grevillea *Alphonsiana* (Cycloptera?); arborescens, ramulis teretibus velutinis, foliis indivisis lineari-ensiformibus planis crasso-coriaceis sensim in petiolum brevem angustatis sphacelato-acuminatis uninerviis aveniis utrinque puberulis, racemis elongatis spiciformibus subpaniculatis velutino-tomentosis centripetis, calycibus pedicello duplo longioribus intus cum pistillo semiunciali glabris, germine sessili, stigmate oblique terminali late ovato centro elevato, glandula hypogyna nigrescente conspicua, capsulis . . .

HAB. In deserto Australiæ centralis, *e. g.* ad partes Australis rivi Sturt's Creek, lat. 19–20° austr.

Arbuscula habitu fere *Hakeæ* arborescentis. *Folia* pleraque 4–5″ longa, 2½–3‴ lata, dilute viridia, plus minus curvata. *Cicatrices* ovato-cordatæ, punctis vascularibus æquidistantibus. *Racemi* inferne in racemulos plures divisi, undique cano-tomentosi nec unquam ferruginei. *Calyces* circiter 4‴ longi, intus flavi.—Species *G. polystachyæ* et *G. Sturtii* finitima summa cum veneratione Alphonso de Candolleo dicata.

Grevillea *polybotrya* (Cycloptera); arborescens, ramulis teretibus appresso-puberulis, foliis indivisis vel bi-trifidis v. pinnato-quinquefidis subsessilibus supra glabris subtus sericeis prominenter trinerviis margine recurvis, segmentis elongato-linearibus acutis sphacelato-mucronulatis integerrimis, racemis elongatis confertis dense multifloris centripetis, calycibus extus cum stylo germine pedicellis rachibusque glabris intus infra medium tenuissime puberulis pedicello triplo longioribus, stylo longe exserto, germine stipato, glandula hypogyna conspicua, stigmate oblique terminali longe umbonato, capsulis subrotundis leviter compressis lignescentibus lævibus, seminibus orbiculari-ovatis, ala semine triplo angustiore eique concolori.

HAB. Ad basin montium M'Adam's Range in locis lapidosis.

Folia 6–9″ longa. *Racemi* paucipollicares, albidi. *Fructus* uncia breviores, non valde lignosi. *Semina* sordide cano-fusca.—*G. ceratophyllæ* propinqua.

Hakea *chordophylla;* arborescens, glabra, ramulis teretibus lævibus pruinosis, foliis prælongis teretibus indivisis exsulcis acutis, cicatricibus late ovatis, punctis vascularibus æquidistantibus: medio centrali, racemis exinvolucratis patentibus flore cum pedicello fere triplo longioribus, bracteis caducissimis, calycibus pedicello parum longioribus extus intusque cum pedicello glabris, stylo longe exserto, glandula hypogyna crassa ovato-hippocrepica, stigmate oblique terminali late ovato centro umbonato, capsulis . . .

HAB. In Novæ-Hollandiæ centralis collibus arenosis prope remotissimas partes fluminis Sturt's Creek.

Folia pleraque pedalia. *Racemi* pedunculati, multiflori. *Calyces* vix semunciales. *Stylus* addito germinis stipite circiter 10‴ longus. Habitu *H. longifoliæ*, All. Cunn.

THYMELEÆ.

Pimelea *ammocharis;* fruticosa, dichotome ramosissima, foliis dense imbricatis utrinque cano-sericeis angusto-lanceolatis acutis sessilibus subconcavis, floralibus caulinis conformibus capitula ut plurimum pauciflora æquantibus, floribus dioicis extus sericeis, masculis tubo inarticulato limbi lacinias ovatas fere triplo superante, filamentis inclusis, floribus fœmineis infra medium dense patentimque villosis superne sericeis, stylo incluso.

HAB. In plagis arenosis ad rivum Sturt Australiæ centralis.

Frutex patens, paucipedalis, rarius simpliciter ramosus et stricte erectus. *Ramuli* villoso-sericei. *Folia* decidua, 2–4‴ longa, 1–1½‴ lata. *Flores* lutei.

(*To be continued.*)

BOTANICAL INFORMATION.

Proposed Establishment (or Restoration) of an AGRICULTURAL *and* HORTICULTURAL GARDEN *at* BANGALORE, *in the Madras Presidency.*

The pages of this Journal have borne witness on several occasions to the very active exertions in the cause of Botany and Horticulture —especially the practical and economic departments of Botany—of Dr. Cleghorn, the able Professor of Botany at Madras; and we are not without hope that at his recommendation a Government Garden will be formed at Bangalore, in the territory of Mysore, elevated about 3000 feet above the level of the sea, in what may be considered "one of the finest climates in India, being cool and pleasant throughout the greater part of the year. The gardens produce the usual vegetables of Europe in great abundance, and the products of the flower-gardens are remarkably varied, vivid, and luxuriant." (Thornton's 'Gazetteer of India.') Such is the spot judiciously selected by Dr. Cleghorn; and the following arguments in its favour are extracted from a published letter in an Indian newspaper, addressed by that gentleman to the Government Secretary, Fort St. George, dated August 30th, 1856 :—

"Some years since (1839) an Agri-Horticultural Society was established at Bangalore, under the auspices of the Commissioner, who

made the Lall Bagh over to them, and afforded other assistance in the way of convict labour, etc. In all other respects the society was supported by private contributions; but the constantly fluctuating number of subscribers, the frequent departure of valued supporters, and other similar causes, led to the dissolution of the society in 1842, and the Garden was then restored to the Commissioner. Since that period little has of course been done to it, beyond keeping the walks clean, etc. There are however some fine trees, such as West India Tamarinds, Moreton Bay Chesnuts, Olives from the Levant, two Spanish Oaks, Garcinias, which an able superintendent may turn to good account for ornamental purposes.

"The question of site having thus been disposed of, the next point is the establishment requisite. From my experience in connection with the Madras Gardens, and the results on the Neilgherries, which have followed Mr. M'Ivor's employment, I have no hesitation in declaring that the entertainment of a skilful and practical European Superintendent is indispensable. The object in view is, not merely to improve the culture of indigenous productions, but at the same time to naturalize exotics, and prepare both for introduction in the plains. For such purposes, European skill and ability, both theoretical and practical, are essentially necessary; I would therefore propose that a person like Mr. Jaffrey, now Superintendent at Madras, should be entertained on a salary of 150 rupees per mensem, with a suitable residence in the Gardens or their immediate neighbourhood. An excellent house might be built, I should suppose, for about 2000 rupees, or one might be rented for 30 rupees or 40 rupees per mensem; but I should advise building in the Garden in preference to renting at a distance, as the constant presence of the Superintendent is a matter of great importance.

"The expense proposed would be altogether a monthly grant of 300 rupees, and a single grant of about 2000 rupees, exclusive of the sum required for the possession of a house for the Superintendent.

"As to management, the Garden, the Superintendent, and every person connected with it should be under the immediate and exclusive control of the Commissioner, whose decision and orders must be in all cases final. Any other course would only be attended with embarrassment, and no other is so likely to ensure the success of the undertaking. The Commissioner will probably find it convenient to place the immediate superintendence of the Garden under the charge of some

of his subordinates, either singly or as a committee. The superintendent of the Bangalore division, the secretary, and the surgeon for the time being, would be willing and able to relieve him of details; but this of course is a matter for the consideration of the Commissioner.

"I propose that the Bangalore Garden should be a Government establishment, solely under the Commissioner, who will have no difficulty in framing a few simple rules for the guidance of the Superintendent, who will of course require a reasonable degree of freedom in which to exercise his talents and experimentalize; but he must distinctly understand his position of entire subordination to the Commissioner.

"The great objects in view are the improvement of indigenous products—the introduction of exotics—the supply of these to the hills and plains when acclimatized, and the exhibition to the people of an improved system of cultivation in practical and successful operation. Seeds and plants should invariably be sold at a fair price to all applicants, but none should be given gratuitously, except for public purposes, and then only with the Commissioner's approval. By public purposes, I mean not merely for those of Government, as plantations, avenues, etc., but for distribution to scientific persons for experiment, to public institutions, etc. After providing for the Bangalore Garden, those of Madras and Ootacamund should be considered entitled to the preference (which of course will be mutual), and exchanges should be arranged with Calcutta and other Gardens.

"In conclusion, it appears to me that the advantages to Southern India, generally arising from the Garden in contemplation, promise to be very great, if the scheme be carried out under the superintendence of a competent person, permanently appointed to the charge. There can be no doubt that the climate is highly favourable, and the soil capable of producing the best description of many vegetable products. Bangalore is much better suited for agricultural and horticultural experiments than either Ootacamund or Madras, and from its central position and intermediate elevation the finer kinds of vegetables and better sorts of graft-trees may be disseminated with great success to the neighbouring ranges of hills."

To this letter there has happily been a favourable response, in the Government "Order thereon, dated 15th September, 1856," as follows:—

"In his Review, under date 28th March last, of the Report on the

Government Gardens at Ootacamund for 1853–55, Dr. Cleghorn, Professor of Botany, suggested the establishment of a Garden in a situation which would form a connecting link between the Gardens at Madras and Ootacamund. He observed, '1. The difference of temperature between the Neilgherry hills and the Carnatic plains is so great, that I fear many valuable plants acclimatized in the former would not succeed if at once transplanted to the latter, and I would therefore suggest that Government should propose to a Commissioner at Mysore the establishment of a garden, under skilled superintendence, at Bangalore. The Government of Madras need not have any control over this Garden, for the management of which the Commissioner would no doubt arrange. All that is necessary is, that these institutions should be considered parts of one system, and that each should have the preference over private parties to the productions of the others. There would be no difficulty in arranging this matter, and I think the plan holds out the best hope of introducing into the Presidency *generally* many valuable plants.'

"2. Dr. Cleghorn's review was communicated by this Government to the Commissioner of Mysore with the remark that they considered the proposal for the formation of an intermediate Garden at Bangalore to be highly deserving of adoption, and likely to lead to very valuable results. The review, and the observations of Government thereon, were also submitted to the Government of India.

"3. The Commissioner of Mysore entered warmly into the scheme, and at his suggestion Dr. Cleghorn was requested to visit Bangalore and to confer with General Cubbon upon the establishment of the proposed Garden, taking advantage of the time when Mr. Jaffrey, superintendent of the Agri-Horticultural Garden at Madras, was at Bangalore, on his return from the Neilgherries to Madras.

"4. In the letter above recorded Dr. Cleghorn reports the result of his visit to Bangalore and consultation with General Cubbon, as well as with Mr. Jaffrey. The issue is altogether satisfactory. An eligible site with good soil and command of water has been selected on the Lall Bagh. Dr. Cleghorn describes the arrangements and establishment that he would recommend. The Madras Government do not discuss these in detail, as they are rather subjects for the consideration of the Commissioner, and for submission by him to the Government of India. In forwarding the report to Lieutenant-General Sir Mark Cubbon, they would therefore only express in general terms their entire

approval of Dr. Cleghorn's propositions and their willingness to cooperate with the Commissioner in any measures calculated either to facilitate the formation of the Garden or to ensure its success when established."

NOTICES OF BOOKS.

Plantæ Indiæ Batavæ Orientalis.

We are happy to be able to announce a very important work about to appear in Holland, under the title,—"*Plantæ Indiæ Batavæ Orientalis quas in itinere per Insulas Archipelagi Indici, Javam, Amboinam, Celebem, Ternatam, aliasque, annis* 1815–1822, *exploravit* Casp. Geo. Carol. Reinwardt, *Agriculturæ, Artibus Disciplinisque in India Batava Orientali Præfectus, et in Academia Lugduno-Batava Prof.*:"—in other words, a "History of the Plants in the Dutch East Indies discovered in an Expedition made for scientific purposes, in the Islands of Java, Amboina, Celebes, Ternate, etc., in the years 1815 to 1821; by the late Dr. C. G. C. Reinwardt, Commissary for the affairs relating to agriculture, arts, sciences, etc. etc. in the East Indies, and Professor in the University at Leyden:—in 4to, with 40 plates; published by order of His Majesty King William III.; by Dr. W. H. De Vriese, Professor of Botany in the University of Leyden."

The following interesting particulars will explain more fully the nature and object of the work, and the truly praiseworthy motives that have led the excellent Dr. De Vriese to undertake its publication.

"The ever-memorable events in the thirteenth and fourteenth years of the nineteenth century, under the dynasty of the illustrious House of Orange, restored to the Netherlands their independence and their rank among the nations of Europe. The new State reacquired its ancient possessions in the East Indies and in America. The spirit of commerce soon assumed a new life. One of the chief cares of the Sovereign Prince William I., shortly after King of the Netherlands, was to regulate all that affected the interests of these Colonies, not only with a view to their government, but particularly with regard to the numerous resources which these rich islands of the Archipelago presented to open a

new career to industry and commerce, on which this generous monarch bestowed an unbounded patronage during a reign of more than a quarter of a century. It was more than time to study carefully the nature and productions of these rich countries. It was, in short, necessary to follow the example of other maritime powers who had learned the way to make their colonies the objects of studies eminently useful. How many results might not be promised, for the development of agriculture, manufacture, commerce, navigation; and in how great a degree these results were to contribute to the prosperity, not only of the mother-country, but also of the Indies themselves! In a word, should not this solid basis given to Dutch activity contribute to illustrate that happy and memorable period, at which the Netherlands recovered their rank among nations? The choice of those who were to pave the way in India for this grand enterprise was important, for on the first steps depended in a great degree the successful progress of the measures which were to be adopted. It required a man of intelligence, well-informed, but familiar with the practical application of many sciences; a man zealous and enterprising, capable of surmounting the difficulties which present themselves in every way somewhat new,—one animated by that devotedness which causes him to seek, on every occasion, and at the cost of any efforts, to extend the field of human knowledge, and to increase the treasure which each generation bequeaths to its successor.

"The choice of the Sovereign Prince was fixed on Dr. C. G. C. Reinwardt, then Professor and Director of the Museum of Natural History at Amsterdam. His Royal Highness commanded this naturalist to accompany their Excellencies the Commissaries-General Messrs. Van der Capellen, Elout, and Buyksen, who were to proceed to the Indies to take possession of the territory, and to regulate the government and the form of the administration. Dr. Reinwardt was to assist them with his advice on all matters respecting public instruction, the culture of the soil, medical service, the introduction of vaccination, the interests of the branches of natural sciences and their technical application, the productions of the three kingdoms of nature, etc. etc.;—in short, by journeys undertaken with these points in view, he was to commence the necessary investigations in such a manner as should ensure an easy continnation for the future. A similar mission is rare, not to say unique, in the annals of science. Dr. Reinwardt had accorded to him, with a

liberality truly princely, all that was necessary or useful. He set out in 1815, accompanied by several persons able to second him in his difficult task, among others by Messrs. Bik and Payen, excellent draughtsmen, who indeed rendered him important service.

"No one has ever pretended that Dr. Reinwardt did not well acquit himself of his task. I have spoken of it at length in a biography which I have in manuscript and intend to publish. A journey on the island of Java, made with the Commissaries-General, an excursion in the Moluccas, long sojourns in the islands of Amboina, Banda, Timor, Celebes, Ternate, etc., were a part of his travels in the East Indies. During these expeditions Dr. Reinwardt made numerous discoveries in many branches of natural science. They may, in general, be ranged under two heads:—those which specially have reference to the history of the countries, their productions, inhabitants, etc., and those which have reference to Mineralogy, Zoology, and Botany. During his travels Dr. Reinwardt made considerable collections, of which those that do not belong to the vegetable kingdom are placed in the Museum of Natural History at Leyden; such as have escaped the shipwrecks, in which three rich collections, despatched for Holland, were swallowed up. With regard to Dr. Reinwardt's drawings and notes, they were preserved, as well as his herbaria, by himself till his death, which took place in March, 1854.

"On his return from his travels in 1822, Dr. Reinwardt found a double task of great importance to fulfil. During his stay at Java, he had been appointed to succeed to the chair vacant by the death of the immortal Brugmans. The duties ofthispost were already too manifold to be laid on one man. The zeal with which Dr. Reinwardt applied himself to them is too well known, but particularly at Leyden, for it to be necessary for us to relate in detail the manner in which he acquitted himself of his academical functions. But, besides, he had to compile a general report of his mission to the Indies. It was expected of the learned naturalist, that he should carefully set in order and study the materials he had collected, and that he should publish an exact and detailed account of all his researches. Unfortunately Dr. Reinwardt was not able to satisfy so just an expectation, and in a sense so extended. For many years the Government had the advantage of his intelligence on the gravest questions relating to Colonial affairs. He occasionally made the most interesting communications to the Royal Institute of the

Netherlands. He communicated his scientific treasures, in a manner the most generous, and often even prodigal and imprudent, to his fellow-naturalists and scientific connections, leaving to his true friends the bitter regret of not having seen him publish himself the discoveries and precious observations he had made, by which he would have illustrated his name, and at the same time have raised a monument to the honour of the Netherlands.

"However here, as in the Indies, the researches which Dr. Reinwardt, by his instructions, had commenced, were continued with activity. We cannot without injustice pass over the important services rendered with zeal and perseverance by many naturalists, who, after Dr. Reinwardt, have studied the history and nature of our Indian possessions, and by others, to whom their occupations left all the leisure desirable to devote themselves to scientific researches, and to make known to the learned world their own studies or those of Dr. Reinwardt, often without even noticing the name of their author. The view of such an injury, the pressure of numerous public functions, the approach of old-age, must have contributed to distract Dr. Reinwardt from the execution of a great work, of which he had commenced the compilation on a large plan, and of which the manuscript is in my hands.

"After Dr. Reinwardt's decease, in March, 1854, his family resolved to offer the King all his scientific heritage, that is to say, his herbarium, notes, drawings, etc., on the condition that they should be placed in the Academical Collection of the Botanical Garden, with the care of which I am entrusted. At the same time they expressed a desire that I would publish all in these collections that should be found worthy of being published, either for the advantage of science, or to commemorate the merits and labours of this meritorious naturalist.

"On the proposition of the Minister of the Colonies, Mr. P. Meyer, His Majesty the King has been pleased to entrust me with this honourable task.

"I propose, then, first to publish, and in this work, the plants that Dr. Reinwardt discovered during his travels in the Indies, and to expose their history, as far as it has not been the object of the researches and publications of other botanists. When we reflect that Messrs. Bennett and Robert Brown have still recently published the plants which Dr. Horsefield discovered in the Island of Java at the commencement of this century, we shall not be surprised that the discoveries

made by Dr. Reinwardt, between 1815 and 1822, on the islands of Celebes, Ternate, Amboina, etc., should be still worthy of being made public. We nowise doubt that the study by which we propose to publish the botanical researches of Dr. Reinwardt will bring to light a great number of new plants, and contribute to give a better knowledge of the geographical distribution of plants in a portion of the Indian Archipelago yet so little known in its relation to the vegetable kingdom.

"The notes, made on the spot by Dr. Reinwardt, are generally very concise, but they may often guide us in our studies of his plants. We shall everywhere make it a sacred duty to throw out his own views, so that all the honour, all the merit, may return to him to whom they rightly belong.

"Particular circumstances induce us not to adopt a regular and systematic order of families. At the end of the work will be appended a register, to indicate the pages at which each family is to be found.

"The publication will be in ten numbers, each containing eighty pages of text, in Latin, accompanied by four lithographic plates; price 8 florins of the Netherlands.

"The work will appear so that three numbers shall be published in current year, four more in 1857, and the rest in 1858.

"I take the liberty to recommend this undertaking to all the friends of science, and beg them to second it with their powerful support."

"W. H. De Vriese.

"*Leyden, September* 18, 1856."

Mettenius, G.; Filices Lechlerianæ, *Chilenses ac Peruanæ.* 8vo. Leipzig. Thirty pages; three folding Plates. 1856.

Dr. Mettenius has, we believe, succeeded to the Chair of Botany lately occupied by Professor Kunze at Leipzig, and he appears to devote himself to the study of Ferns with the same ardour and success as his able predecessor. The present is one of three works on Ferns of the author, which has just reached our hands; it gives a list of 144 species (including *Pseudo-Filices*). A few new species are described, and these are accompanied by neatly executed and faithful figures.

Notes on the Herbarium *of the* Calcutta Botanic Garden, *with especial reference to the completion of the* Flora Indica; *by* Thomas Thomson, M.D., F.R.S., Supt. H. C. Bot. Garden.

(*Continued from p.* 14.)

The commencement of the present Herbarium of the Calcutta Botanic Garden dates from Dr. Wallich's return to India in 1832. The separate collections of which it is made up having been incorporated together, the following list has been prepared to show the origin of the different parts thus combined into one.

I. *Indian Collections.*

1. A few specimens from the Carnatic, collected and named by Dr. Rottler and given by him to Dr. Wallich, who brought them with him from Denmark.

2. A complete series of specimens collected and dried in the Botanic Garden. Most of these are ticketed by Dr. Wallich, the collection having undergone careful revision by him after his return from Europe in 1833.

3. A portion of the collection made in Khasia and Assam by the Assam Tea Deputation in 1835–36, consisting chiefly of Endogenous and Acrogenous plants. The Exogens of this collection were sent home by orders of the Honourable Court of Directors about four years ago.

4. A large collection from the Khasia Hills made by collectors in Garden employ. This collection contains many duplicates.

5. A very extensive collection, made in Assam by the Garden collectors under the able superintendence of Colonel Jenkins, containing a very complete series of plants of the plains and lower hill jungles of Assam, with many duplicates. It contains also a few specimens from the Bhotan Mountains.

6. A very extensive collection made in the plains and hilly districts of Upper Assam and in the Naga Mountains by Mr. W. J. Masters, and presented by him to the Garden. The collection is remarkable for the very careful manner in which the localities are marked upon each specimen. It contains many rare and valuable plants, and numerous duplicates.

7. Colonel Vicary's Indian collections, made in the Saugor district.

in Birbhúm, Berhampur, Dinajpur, and in the districts of Garhwal, Simla and Kunawar in the Western Himalaya. This collection contains few duplicates, and many of the specimens are in a bad state of preservation, but it is very valuable, because the locality of every specimen is carefully marked on a ticket attached to the plant, or written on the sheet of paper in which it is enclosed. The Saugor and Himalayan collections are the best. Both contain many plants which were unknown to botanists at the time these collections were formed, but which have since been discovered by subsequent collectors and published in various works.

8. A small collection of Ceylon plants presented to the Garden by Mr. J. Watson in 1836, contains no duplicates.

9. *Mr. Griffith's collections.*—Two complete sets of these most valuable collections were sent to England, and are (I believe) in the India House. The triplicates remained with Dr. M'Clelland during the time that he was occupied in the publication of Mr. Griffith's posthumous papers, and were transferred by him to my charge in 1856. A small collection, chiefly of Afghan and Malacca plants, has been in the Garden Herbarium since 1848. Those received in 1856 consist partly of garden plants selected by Mr. Griffith for himself from the Garden Herbarium, but mainly of more or less complete sets of the collections made by Mr. Griffith on his several journeys. The specimens retain in many cases the original tickets and are carefully numbered. The numbers correspond with those of Griffith's 'Itinerary Notes,' published by Dr. M'Clelland. None of the series are complete, but the number of Afghan and Khasia plants is much greater than that of Bhotan or Mishmi ones. There are also a great many excellent specimens from Malacca, and a few from the Coromandel Coast. The collection contains likewise a considerable number of specimens from Sambalpore collected by the late Major Kitto, some specimens from the Carnatic collected by Mr. Griffith soon after his arrival in India, and a few of the numbered specimens of the Wallichian Herbarium, which Mr. Griffith seems to have brought with him from England.

10. A small collection, made by Lieutenant Parish, in the district of Mandi in the Punjab Himalaya, during the cold season of 1847–48. The Ferns of this collection are numerous and good.

11. A large collection, made in the Tenasserim provinces by Dr. Falconer, while on deputation (in the year 1849). The specimens are,

in general, excellent, and there are a considerable number of duplicates. The localities are always carefully marked.

12. A collection, made by Dr. M'Clelland in 1849 in the Birbhúm district. The localities are carefully marked, and there are some duplicates.

13. An excellent collection of Assam and Khasia plants, made by Mr. C. J. Simons, and presented to the Garden by Sir W. J. Hooker, K.H. The specimens are very fine, and are all carefully numbered and the localities marked.

14. A set of excellent specimens of Khasia plants collected by Mr. Oldham in 1851–52, and presented by him to the Garden. Mr. Oldham most liberally allowed me to select from his collection as many specimens as I wished, so that we possess excellent illustrative series of specimens of many valuable species.

15. A large collection of Pegu plants made by M. Scott, head gardener H. C. Bot. Garden, while on deputation in that country in 1855. The specimens are very good, and the collection contains many interesting plants.

16. A small collection of rare and interesting Malacca plants, presented by Captain Moxon.

17. A complete set of specimens from the Ceylon Garden Herbarium, presented by Mr. Thwaites, the Director. This is a numbered collection, and contains all the known plants of the island, so that it is of very great value.

18. A large herbarium from the Bombay Presidency, presented by Dr. Gibson, consisting partly of his own collections, and partly of those of Mr. Law, from the Concan and Dekhan, and partly of Dr. Stock's Sindh and Beluchistan collections.

19. A good collection from the Northern Division of the Madras Presidency, presented by Dr. Cleghorn.

20. A most interesting collection from the Punjab Himalaya and Western Tibet, presented by Mr. M. P. Edgworth, C. S. The Himalayan specimens were collected by Mr. Edgworth himself; those from Lahul and Ladak by Captain Hay.

21. A set of the Indian collections made by Drs. Hooker and Thomson between 1841 and 1851, which are now being distributed in England.

These collections illustrate more or less fully the plants of Western

Tibet, of the Western Himalaya, of the Punjab and the Upper Gangetic Plain, of Sikkim and the Khasia Hills, the Sôn Valley, Silhet, Cachar, and Chittagong.

22. Specimens of plants from different parts of India, not sufficiently numerous to be included as collections in this list, have been presented by Mrs. Burney from Ava, by Captain Margrave from Arracan, by the Rev. J. Parry from Jessore, by the Rev. Mr. Schmid from the Nilgherry Hills, by Colonel Madden from the Western Himalaya, by Dr. Fayrer from Khasia, and by Lieutenant Beddome from Jabalpur.

II. *Non-Indian Collections.*

1. An excellent collection of British and other European plants, selected from the Herbarium of the Royal Botanic Garden, Kew, and presented by Sir W. J. Hooker.

2. A good collection of Norwegian plants, presented by Dr. Blytt, an eminent Norwegian botanist, to Mr. Griffith, and received from Dr. M'Clelland in 1856.

3. A large collection of European Grasses, the source of which I have not yet been able to trace. The specimens have printed tickets attached, and were probably purchased by Dr. Wallich.

4. A large collection of Swiss and French plants presented by M. De Candolle to Dr. Wallich, but unfortunately for the most part in very bad preservation.

5. A good collection of British Ferns, presented by Mr. R. Scott.

6. A small collection of Scotch plants, supposed to have been presented to Dr. Griffith by Dr. Balfour.

7. A small set of Sieber's Egyptian plants, purchased by Dr. Wallich.

8. A considerable collection of Cape plants, collected by Dr. Pappe.

9. A collection of Mauritius Ferns, presented by Mr. M'Murray in 1856.

10. A small collection of the plants of the provinces of Dahuria in Asiatic Russia, presented by Dr. Fischer to Dr. Wallich.

11. Interesting collections of Aden plants, presented by Dr. Boycott and Lieutenant Playfair.

12. A large collection of New South Wales plants, presented by Colonel Vicary.

13. A smaller but excellently preserved collection of Australian and Tasmanian plants, the donor of which has not been recorded.

14. A small collection of Tasmanian plants, presented by Captain Margrave.

15. An extensive collection, chiefly of New Holland plants, selected from the Hookerian Herbarium, and presented by Sir W. J. Hooker.

16. A few New Zealand Ferns, presented by Mr. Bedford.

17. A complete collection of the plants of the United States of North America, chiefly from the states of New York, presented by the Rev. S. Williams in 1844. This collection is carefully named and ticketed, and is very valuable.

18. A small collection of North American plants, presented by Mr. Joseph Carson in 1836.

An examination of this list will show that our Herbarium is still very imperfect, and that there is no part of India from which contributions would not be welcome. It is however sufficiently complete to form an excellent basis on which, with the assistance of contributions from all parts of India, a general herbarium may be completed in the course of a few years; and it contains a sufficient number of authentically named specimens to enable me to name the collections with which I may be favoured, without much difficulty, on the spot, and thus to avoid the necessity of sending them to England for comparison.

In a country like India, where the distribution of plants is regulated so completely by the climate, it is most important that botanists, wherever situated, should devote themselves to the complete elaboration of the plants of the district in which they reside; and that they should, if possible, combine careful meteorological observations, especially of humidity, with their botanical labours. It is only thus that the exceptional cases (if there be any) of plants whose distribution is independent of the climate, can be speedily eliminated.

To the philosophical botanist who is desirous of investigating the laws by which the distribution of plants is regulated, no Flora in the world is more interesting than that of India, though it is in point of numbers of species a very poor Flora when compared with Australia, South Africa, or the continent of South America, to all of which Nature has been liberal to profusion in richness and variety of vegetable forms. The interest of the Indian Flora lies in the absence of new forms, in the identity of its plants with those of other countries, in the occurrence of European plants on our western mountains, of Japanese plants in the Eastern Himalaya, of Chinese plants in our dense eastern forests,

of a purely Egyptian Flora in Sindh, of a Polynesian Flora in Malaya, and of numerous African types in the mountains of the Madras Peninsula. It may interest Indian botanists, for whom especially this little paper is intended, to give a slight sketch of the different Floras which co-exist within the limits of British India.

Disregarding for a moment the Malayan Peninsula, British India may be described as an equilateral triangle with sides 1500 miles in length, the apex advancing far within the tropics, the base in the hotter part of the temperate zone. The tropical portion of this triangle is traversed by ranges of hills of moderate elevation, most lofty toward the south, where they rise above 8000 feet, less lofty in the north, where the average height of the ridges is not more than 4000 feet. Within the temperate zone the level of the surface is much lower, and it is there occupied by the basins of two great rivers: the Indus on the west and the Ganges on the east. South of the tropic this large triangle is everywhere surrounded by sea, but north of the tropic the boundaries of India are traced on land, and are more or less artificial.

The Indian Peninsula includes two distinct mountain-systems. The meridional chain of the Ghats attains in Travancore and Malabar an elevation of 8000 feet, but north of Nagar rarely more than 4000. It runs parallel to the western coast, and sends off transverse chains running east, which are flattened out into a table-land highest in the south, where the continent is narrow, lower to the north, where the continent is wider and the rivers larger. North of the Godavery the transverse range of the Vindhia runs from sea to sea, almost on the tropic, sending out on all sides table-topped branches, and connected by a low ridge with the Ghats further south, and with the Himalaya by the curious oblique Arawali range, which forms a water-shed between the Indus and Ganges.

An extensive plain, watered by the Indus on the one hand and by the Ganges on the other, separates the Indian Peninsula from the Himalaya, which rises on the north, a stupendous barrier, constituting the Indian portion of the enormous mountain-mass of Central Asia, which presents steep declivities in all directions.

After the configuration and elevation of the land, the most important element by which the distribution of vegetable forms is regulated, is climate. The climate of India depends mainly on the rain-fall. Situated entirely in the northern hemisphere, and with an enormous

mass of land to the north, the summer winds blow strongly from the south, while the winter winds are northerly. The south wind, commonly called the south-west monsoon, is always a sea wind, and therefore brings rain. The summer is therefore the rainy season in India. The northern winter wind is generally a land wind, so that the winters are generally dry. To this there are two exceptions, the coast of the Carnatic and the Malayan Peninsula, in both of which the north-east monsoon is a sea-breeze, and therefore a rain-bringing wind.

The normal climate of India is divided into a cold, hot, and rainy season, but the amount of rain depends on the position of each place. The west coast of the peninsula, which presents to the south-west wind a lofty range of mountains, is extremely rainy at one season, but the east coast, being sheltered by the higher hills to the westward, is much less so. On the Ghats the rain-fall diminishes as we go north, and when we reach Gujerat has become very small indeed. In Sindh there is no rain at any season.

In the Himalaya the rains are heaviest to the eastward, where the chain is nearest the sea, and they diminish gradually as we proceed west, till they entirely disappear in the mountains of Afghanistan. In the Malayan Peninsula, in which both monsoons blow over sea, all seasons of the year are rainy, the summer or south-west monsoon being rather drier from the intervention of the island of Sumatra, which condenses much of the rain at that season.

In consequence of differences of elevation, three different climates require to be studied in treating of the vegetation of India. These are the tropical, the temperate, and the alpine. Rising out of the hottest part of the temperate zone into the regions of perpetual snow, the slopes of the Himalaya exhibit all these forms of vegetation at different elevations; but as none of the mountains of the Peninsula rise above the temperate zone, the alpine Flora is found only in the Himalaya. This alpine Flora is found at elevations above 13,000 feet, and varies with the degree of moisture. In the outer Himalaya, where the snow-fall is copious and the summer humid, but with bright sunshine, we have a Flora closely resembling that of the Alps of Europe. A similar Flora is found on the highest peaks of Afghanistan, of Persia, and of Asia Minor, and beyond Europe extends into the alps of Greenland and of temperate North America. In the more arid mountains of the interior we find a purely Siberian Flora.

In Southern India the temperate Flora begins about 7000 feet of elevation, but as we advance northward, the requisite elevation gradually diminishes till in the most northern part of the Himalaya it is not more than 4000 feet. In Southern India therefore the temperate Flora is found only in isolated patches on the mountain-tops, but along the Himalaya it is continuous from one end of the chain to the other. Here it presents three distinct types, the first of which is the normal Himalayan type, of forms which are adapted to a climate dry at one season, wet at another, occupying the Central Himalaya. To the west we have the European type intruding upon and mingling with it, especially in the inner ranges, where the climate is drier. To the east the Japan or moist temperate Flora is especially developed in Khasia and Sikkim, where the climate, throughout the year, or at least throughout the whole period of vegetation, is extremely moist.

The tropical Flora is dependent in like manner upon the climate, and partially also on the nature of the surface. The open plain of the Indus and Ganges, which stretches from sea to sea, has a gradually diminishing rain-fall as we ascend the Ganges and approach the Indus. The rain-fall is also greater everywhere near the base of the Himalaya, and diminishes as we recede from it. In Sindh and the Western Panjab no rain falls, and there we find an arid Flora, identical with that of Egypt, with which in fact it is continuous across Arabia and Southern Persia. The characteristic plants of this arid Flora extend at a distance from the mountains down the valley of the Ganges, but never approach the more humid Himalaya, in which we have a Flora like that of Bengal, though they recur in the Deccan and Carnatic, which are sheltered from the moist wind of the south-west monsoon by the higher ranges of the Ghats.

In the hilly districts of India, where a dry hot season is succeeded by more or less heavy rain during the monsoon, we find in all parts of the empire a very similar Flora. On the eastern slopes of the Ghats, in the valleys of Nagpore, on the slopes of the Arawali, and along the base of the Himalaya (except to the eastward and in the extreme west) we find the same monotonous forest, consisting partly of evergreen and partly of deciduous-leaved trees, with many creepers. The trees are gay with flowers in spring, and after being scorched by the intense heat of May and June, burst into life with renewed vigour at the commencement of the rains.

It is only when the humidity begins to linger in the damp and shady valleys throughout the year that the Flora changes its character. This we find to be the case in many parts of the valley of the Nerbada, and in the deeper ravines of the Ghats of the Concan. The number of peculiar forms increases as we go southward, and is very great in the forests of Travancore and Ceylon. So in the Central Himalaya, humid forms appear as far west as Kumaon, increase in numbers in Nipal, predominate in Sikkim, and are universal in Assam. In Malaya, where the climate is humid at all seasons, we have the Flora of the Archipelago, the richest and most varied which is found in any part of India.

I might illustrate each of these floras at great length, but the object of this paper is not to bring forward examples of each, but to induce botanists to lend their assistance in establishing their limits on a sure basis of observation, by collecting as far as they can, and transmitting for examination and comparison, the plants of their respective neighbourhoods, so that the exact area inhabited by every species may be ascertained, and the main facts of the Geographical Botany of India be accurately determined.

Sketch of the Life and Writings of M. DE MARTIUS, Secretary to the Bavarian Academy of Science; *by* ALPHONSE DE CANDOLLE.

(*Continued from p.* 10.)

Such are the principal publications which Martius has performed or inspected, and it is superfluous after them to enumerate the essays, pamphlets, and articles in periodical works, whose list alone would fill several pages. I would only specify his descriptions and figures of the Palms collected by D'Orbigny, some important tracts on *Eriocaulon* and *Xyris*, and a valuable treatise, conjointly with Nees, on the plants collected during the expedition of the Prince de Neuwied. Martius was one of the first to ascertain and describe the Potato disease; he has studied agriculture, vegetable physiology, and fossil plants; he translated into English the work of Sir Humphry Davy on the Travels and Latter Days of a Naturalist; and analyzed numerous French, English, Italian, and Portuguese publications in the Munich 'Gelehrte Anzeigen.' It is impossible to enter into such details as would convey any adequate idea of his extensive and varied knowledge, his ready and

comprehensive mind; nor can I describe the importance of his public teaching, his brilliant speeches before the Academy, when, fresh from his journey, he related some of its incidents and described the magnificent contrasts of tropical vegetation. Finally, I would cite, as eminently praiseworthy, his spirit of enlightened candour and benevolence, which rendered warm and ample justice to his colleagues,—as his patron Schrank, his fellow-worker Zuccarini, his correspondents Bouvard, Geoffroy St. Hilaire, Ledebour, Oken, De Candolle, the Count de Bray, Treviranus, and many others, of whom he spoke with heartfelt admiration and discriminating applause. I must confess myself deeply grateful to M. de Martius for his eloquent eulogium of my father, in 1842; but without dwelling on personal feelings I would look to the history of science, and may assert that Martius's career has yielded much valuable information for future naturalists. Let us inquire into his peculiar merit, and wherein he peculiarly deserves to be followed,—an inquiry which is the more seasonable, as, for the last few years, Botany has appeared, in France and Germany, to depart from its original course; and it may be well to ascertain whether its disciples have at all strayed, in pursuing, for half of this century, the now somewhat slighted track of Dioscorides, Bauhin, Tournefort, and Linnæus.

Together with these great men and with his more immediate contemporaries, Martius, while paying due regard to diverse branches of Botany, held firmly the opinion that to describe and classify vegetable productions is the main object of the science. In this respect he differed materially from those writers who now limit themselves perhaps to Physiology, perhaps to the study of some particular organs, possibly to the plants of their own country alone, without seeking to trace the causes of geographical distribution, or the analogy of the genera and families in various lands. If this extreme limitation is caused by personal circumstances,—as the difficulty of obtaining access to books and herbaria,—by an inconvenient residence, etc., it is to be commended as a mark of prudence, always provided that every effort has been made to preserve the necessary materials for consultation, at home or abroad. As a system, it is faulty and pernicious; for even in the most special studies a wide and varied range of ideas and of information is needful. An acquaintance with several languages, and with the methods and processes of other branches of science, are often useful. Thus an acquaintance with botanical affinities is necessary to the man who studies

organography; the physiologist ought to have some acquaintance with chemistry, pharmacy, agriculture, horticulture, and botany; the microscopist may certainly dispense with much, but not with some experience in optical instruments, nor with the power to verify the name of a plant. The example of some men goes to prove that for even the most restricted branches of study extensive information is highly valuable; for M. Tulasne, who is the ablest microscopist of the present day, is a Doctor of Laws, and the erudite author of several botanical monographs of flowering plants. Let people say what they will, and despite the present disposition to adhere to minutiæ, the essential object of Botany is and always will be to know plants; and if a thing, to be understood, must be studied all round, it is needful to pass from one part of it to another as well as profoundly to investigate any one point. It is the same with all departments of knowledge. The superiority of a man consists in his being able to grasp the whole of a subject, as well as its details, and to turn rapidly to each. Thus will the able lawyer descend from the high principles of justice to the articles of a code and the minute details of a cause, and again rapidly rise to the theory of law. A great General will turn from strategical questions to the concerns of the commissariat, and from the scrutiny of an advanced post to a diplomatic correspondence. And this universal (so to speak) knowledge is eminently valuable to a writer who works both in description and classification, the latter requiring a full consideration of all the organs, their situation and evolution, of the affinities of plants, their properties, physiology, and geographical distribution; and it also demands an acquaintance with the principles of nomenclature, the importance of characters, and the value of previous publications on the subject. All these points must be borne in mind and weighed; and it is thus the various mental qualities are brought into action.

For the above reasons, the work of classification is far more difficult than it appears, and very few men perform it thoroughly well. But on the other hand, such labours amply reward those who pursue them, for nothing in science lasts so long. It is plain that books of physiology become antiquated and useless, whenever chemistry changes, and the transitions of that science are not few. Who cares for the microscopical observations made in the time of Grew and Malpighi? Nor are those in the beginning of the century much more consulted, except for the purpose of following the history of the study. Opticians and

physicians are entitled to claim the credit of microscopical botanists. If an invention should be made in 1857, by which microscopical objects could be examined without cutting them, or by which the observer could dissect with certainty under a lens of 300 or 400 magnifying power, the labours of the ablest microscopists of 1855 would become as valueless as those of half a century ago, perhaps even of Grew. Now this is not the case with descriptive Botany. The books which first describe certain plants and tribes of plants, especially if accompanied by plates, executed from Nature, will always be consulted. This I steadily affirm: and I never fail to point out to students who aspire to gain a name in science, that the works of Clusius, Prosper Alpinus, Dodonæus, and the Bauhins are still referred to, because they described and delineated fairly accurately the plants then known; while hardly anybody has ever heard of a certain Costæus, who, at the very same time, wrote on the organs and growth of vegetables. Swartz and Jacquin, towards the end of the last century, were not perhaps more distinguished men than Senebier and Kieser; but the two former have left excellent works on the species and genera then known, and admirable plates of rare plants, and they are therefore cited and consulted even at the present day.

And now if we return to M. de Martius, and if we inquire what will be thought of him fifty or a hundred years hence, the reply is easy—according to the necessary and historical march of science. He has published upwards of a thousand plates, all original, carefully executed, full of analyses, and accompanied by admirable descriptions and full information upon the localities and properties of the hitherto unknown kinds. And he has thus guaranteed himself a lasting reputation. The plates are as follows, in—

Reise in Brasilien	53 plates.
Nova Genera	300
Icones Cryptog. Brasil.	76
Eriocauleæ	19
Choix de Plantes du Jardin de Munich	16
Palms	245
Flora Brasiliensis, fasc. 1–15	321
Palmetum Orbignyanum	31
Sundry Essays, etc. etc.	?
Total	1061

Perhaps I may be told that a man's worth is not to be judged by the duration of his name, or Erostratus would be a very great man. True: we must rather consider why the man's name has lived so long. Now, the description of an unknown plant implies a new fact; and no botanist has better earned the credit of such discoveries than M. de Martius, who travelled far and often braved pestilential regions to procure his plants, and who afterwards studied, classified, and figured them. It is not generally that one person is able both to collect and to describe: and if I am reminded that the subject of my present essay had many fellow-workers, this circumstance does not detract from his merit; for his own performances were considerable, while his knowledge enabled him to select the best helpers. Seldom does this happy harmony occur; and the want of it has rendered many a scientific undertaking futile. Of all the botanists who explored Brazil, few had M. de Martius' skill and good fortune in this very respect. For instance, M. de St. Hilaire, who had money, family connections, friends and pupils, and who travelled and collected much: every one knows how small is the amount of his achievements towards the furtherance of Natural History. The fact is that it does not suffice to incur labour and expense, nor even to set the example, in order to stimulate others to work; but one must have a knowledge of character, and some geniality of disposition, and, above all, a hearty interest in science, which swallows up all selfish considerations. And with these moral qualities and expansive views, M. de Martius is eminently endowed.

Expansive ideas and an instinctive looking beyond minutiæ, except as they indicate great facts,—such is his character, which places him among the botanical reformers and the resuscitators of science in our day. He early appreciated the Natural Method, though his masters all held by the Linnæan System; and the sight of new plants impressed on his clear mind the value of Jussieu's ideas, which, again, were first suggested by Magnol and Adanson. He was the first promoter in Germany of this method, which is founded on natural affinities; while he held by Linnæus's comprehensive views. He is endowed with many qualities which indicate scientific merit, among which I would instance that of discriminating and constituting genera, which marks a sound appreciation of Nature, and which is his in common with Tournefort, Linnæus, A. L. de Jussieu, De Candolle, and R. Brown, all of whom have established genera, whose value is seen and

felt, spite of an immense accumulation of newly discovered forms. These *savans* have not at all handled the species nor the higher relations between genera in an equally masterly way, which warrants me in believing that a botanist may to a great degree be judged by the value of his genera. Now the genera of M. de Martius are not contested: to me they are excellent, and I have read also with pleasure his specific descriptions, which are clear, well-written, and evidently drawn up by a man who has either seen the plant in a living state, or examined analogous ones in the Herbarium.

Besides an author's chief works, he generally publishes pamphlets, memoirs, etc., more or fewer; and if the writer is an active person and lives in literary society, these his auxiliary works are numerous, and possess a certain degree of merit. They are useful at the time, but seldom are worth translation, and are always mingled with defects, for the new ideas which they present are often hurriedly put forth, and sometimes aim more at effect than at pure scientific truth. Perhaps a journal requires the article to be ready by a certain day, or the printer is waiting for work, or, as in the universities of the north, such tracts were hastily prepared for the use of students, who demand clearness and decision, rather than depth. At least, however the case may be in Munich, I have known an ingenious theory to be proposed in France, which was vehemently praised by a hundred or two of the students, and which even caused a distinguished Professor to commit himself further than was wise. The disciples of Linnæus, when they gave to the world all his dissertations, instead of a selection from them, did him an ill turn; and, generally speaking, it is with this small coin of science and literature, that men of the highest merit make the worst speculations.

M. de Martius could not always escape the trials of other men of letters. So far as I can judge by the perusal of German periodicals, many persons, instead of being thankful for the instruction and the mass of new and striking notions which their country received from the subject of this memoir, have attacked him on points whereon it is more probable that his critics were in error than himself. For instance, he was reproached for having too lightly credited M. Schleiden's discoveries of the pollen-tubes: and now it is M. Schleiden himself who pronounces Martius a "dreamer." Yet the 'Voyage au Brésil,' the 'Nova Genera,' the 'Flora Brasiliensis,' and the 'History of Palms'

are no dreams, but the productions of a man thoroughly awake; and M. Schleiden himself says that he founds his censure on a trifling production which is no more, in comparison, than a speck of dust. It must be confessed that the unpolished style, in which some of the German Professors in the smaller universities are wont to indulge, reminds us of the Middle Ages. Their criticisms are hardly worth notice: and we would prefer, in closing, to petition M. de Martius that he would give us yearly, from his own pen or by the help of his friends, two or three fasciculi of the 'Flora Brasiliensis,' equally admirable as those which he has published in 1855.

Descriptions of Two New DILLENIACEOUS PLANTS *from* New Caledonia *and* Tropical Australia; *by* J. D. HOOKER, M.D., F.R.S., etc. (With Two Plates, Tab. I. and II.)

Nov. gen. TRISEMA, *Hook. fil.*

Sepala 5, coriacea, persistentia. *Petala* 3, decidua. *Stamina* plurima, sub-3-serialia, æquilonga, ovarium ambientia; *filamentis* filiformibus; *antheris* lineari-oblongis. *Ovarium* 1, oblique ovatum, sericeum, in stylum lateralem subulatum abrupte attenuatum, 1-loculare; *stigmate* simplici; *ovulis* 6–8, juxta basin ovarii lateraliter insertis, biseriatis. *Fructus* ignotus.—Frutex Austro-Caledoniæ; ramis ramulisque *teretibus, cano-tomentosis, cicatricatis;* foliis *alternis, patentibus, petiolatis, obovatis, retusis emarginatisve, valde coriaceis, integerrimis, supra lucidis, subtus parce canis glaberrimisve, venis lateralibus horizontalibus obscuris;* paniculis *axillaribus, versus apices ramulorum, longe pedunculatis, ramis cano-tomentosis;* floribus *secus ramulos paniculæ subsessilibus, basi bracteolatis;* sepalis *extus dense sericeo-tomentosis, ovatis, acutis;* petalis *flavis, calycem paulo superantibus, obovato-oblongis, acutis;* staminibus *petalis $\frac{1}{3}$ brevioribus.*

1. Trisema *coriaceum*, H.f. (Tab. I.)

HAB. Insula Pinorum Novæ-Caledoniæ, versus summum montis. (*J. Macgillivray* et *Milne* in itinere navarchi Denham, Oct. 1853.)

Although the fruit of this remarkable plant is as yet unknown, there can be no doubt, I think, of its being a genuine member of *Dilleniaceæ*, differing however from all its congeners in the reduction of the petals

to three, and from all but a few *Pleurandræ* and *Hibbertiæ*, in the solitary ovary. In respect of the irregular corolla it approaches *Hemistemma*, in which two of the petals are occasionally smaller than the others, and unsymmetrically arranged; in that genus however the irregularity is shared by the stamens to even a greater degree, whereas in *Trisema* the staminal whorl is perfectly regular. It is further worthy of notice, that the ovary being solitary in *Trisema* is another irregularity, the normal disposition of the female organs in the Order being a whorl; there are here, therefore, regular calycine and staminal whorls, and irregular corolline and ovarian ones; whereas in *Hemistemma* all the whorls but the calycine are irregular, the staminal being most so; in *Pleurandra* the ovarian and staminal whorls alone are irregular; and in *Hibbertia* and others the ovarian only. This irregularity of the flowers is as prevalent a feature in the closely allied Order *Ranunculaceæ*, from which indeed *Dilleniaceæ* are chiefly distinguished by the shrubby or arboreous habit of most, their coriaceous, invariably persistent sepals, the almost constant presence of an arillus, and they further want that tendency to a multiplication of the corolline and ovarian whorls so conspicuous in *Ranunculaceæ*.

The irregularity of the flowers of *Dilleniaceæ* should be taken into account in all attempts to explain the origin and relations of the floral organs and whorls in *Ranunculaceæ;* and considering these Orders as forming parts of one group, few are more instructive in this respect, from the number of instances both of total suppression and of great multiplication, which they present.

PLATE I. Fig. 1. bud. 2. Flower, laid open. 3. Stamen. 4. Ovary. 5. Vertical section of ovary. 6. Ovule:—*all magnified.*

2. Hemistemma *candicans*, H.f.; ramulis cinereo-pubescentibus apice angulatis, foliis breve petiolatis anguste lineari-lanceolatis acutis supra glabratis subtus tomento niveo arcte appresso tectis nervis et costa glabratis, racemis axillaribus abbreviatis paucifloris, pedunculis foliis brevioribus 2–5-floris cinereo-pubescentibus, floribus subsessilibus, petalis obcordatis 3 superioribus majoribus, staminibus biseriatis serie exteriore linearibus anantheris basi connatis, ovariis 2. (Tab. II.)

HAB. In Australia orientali tropica ad Cap. York. (*J. Macgillivray* legit, itinere navarchi Stanley, October, 1848.)

H. dealbatæ proxima, sed differt foliis angustioribus supra medium

W. Fitch del et lith.

Vincent Brooks Imp.

Trisema coriacea, *H.f.*

W. Fitch del et lith. Vincent Brooks Imp.

Hemistemma candicans, H. f.

non dilatatis, et racemis axillaribus foliis multoties brevioribus.—*Folia* 3 unc. longa, $\frac{2}{3}$ unc. lata, juniora supra subsericea. *Pedunculi* sicco angulati, apices versus 3–5-flori, simplices v. divisi. *Bractea* concava sepalisque ovato-oblongis acutis extus dense sericeis. *Petala* 3 superiora postica, calyce longiora, 2 inferiora subdivaricata, minora. *Stamina* antica, fertilia 10–15, antheris lineari-elongatis, filamentis brevibus crassis; sterilia fertilibus æquilonga linearia obtusa. *Ovaria* sinistrorsum et dextrorsum inserta, dense villosa; stylo apice curvo. *Ovula* solitaria.

Plate II. Fig. 1. Flower. 2. Back view of stamens. 3. Front view of stamens and ovaries. 4. Fertile and sterile stamen. 5. Ovary. 6. Vertical section of ditto. 7. Ovule:—*all magnified.*

Some Particulars respecting the Gums *from* Senegal; *by* M. J. Leon Soubeiran.*

The *Senegal Gum*, of which it is hardly necessary to recapitulate the commercial and pharmaceutical uses, is of two kinds, viz. the *Hard Gum from Galam*, or *from below the river*, and the *Friable Gum, or Sadrabeida:* these are the products of different trees and possess distinct properties. As I have been in a position to obtain information respecting them from competent individuals, long resident in our African Colony, I have been induced to study these substances and to draw up descriptions of them, rectifying former errors on the subject.

The *Hard Gum, from Galam*, or from below the river, consists of exudation from the bark of two closely allied species of *Acacia*, the *A. Verek* (Flor. Seneg. Tentam.), and the *A. Neboued* (id.). As their origin is different, so these substances are not exactly alike. The Gum of *Acacia Verek* is white, wrinkled, and dull externally, glassy within, "in the shape of tears, often vermicular and twisted, but generally ovoid or spherical, two inches, often less in diameter, with a slight and agreeable flavour, accompanied by a little acidity, which is scarcely observable but by those who habitually use it." It is perfectly soluble in water, and afford a much clearer and thinner mucilage than that of Gum Arabic: it reddens litmus-paper, though less than Gum does. The *Acacia Verek* is a tree of middling stature, 18–24 feet high at most, much ramified, the branches twisted and armed with numerous

* Read at the Séance de la Soc. Bot. de France, 13th June, 1856.

sharp-pointed thorns: the wood is hard, the bark grey, and from the latter the gummy liquid naturally exudes, which becomes hard in from twenty to thirty days. It is more abundantly diffused, and forms thicker forests on the right bank of the river than the left, growing in Senegal, all round Saint Louis, in Oualo and Ghioloff, and in the country of the Moors, to the confines of the Sahara Desert, as far even as the shifting sands which extend to Cape Verd. In all these localities it is associated with the *Acacia Neboued* (the *Mimosa Neb-neb*, and Red Gum-tree of Adanson), which chiefly differs from *A. Verek* by its redder Gum, which is almost always formed in round balls, from half an inch to an inch in diameter, transparent, and slightly bitter-tasted. The *Neboued Gum*, which dissolves perfectly in its own weight of water, also forms a much thicker mucilage than the *Verek*, and colours litmus-paper very little.

The *Senegal Gum* is chiefly collected by the nomade Arabs of the Southern Sahara, who call themselves Bedaouins (wanderers), but whom the Colonists name Moors. A few quintals of the substance are very occasionally brought by the Negros of Oualo and Ghioloff, who inhabit the left bank of the river: the first are a most apathetic race, and the latter, who offer a remarkably fine sort of Gum, are much debarred from entering the market by the Moors, who are jealous of their neighbours, and who seek to monopolize the trade in Gum.

There are several distinct tribes of Moors, who devote themselves to the collecting of Gum, and each claims and explores its own peculiar oasis or forest of Gum-trees. The best Gum is obtained from the Oasis of Sahel, where hardly any tree grows but *Acacia Verek;* the tribe called Trarzas owns this forest. An inferior article is produced in the Oasis of El-hiebar, which consists more of *Acacia Neboued* than *A. Verek;* it is in the possession of a very numerous family of Marabouts. Again, a still less valuable Gum, called *Gonakie*, comes from the Oasis of El-Fatak; while scattered bands of Arabs collect small quantities of gums, of greater or less value, in remote spots, far from the river.

When the rainy season ceases, in November, the Moors, whom the inundations of the river had driven to considerable distances, return, and set their black slaves to collect the Gum. For two or three months the produce is very limited, but in February, and early in March, when the drought increases, the harvest of Gum becomes more

productive, an east wind always augmenting it, up to June and July. The bark of the Gum-trees, which has been saturated with water and rain, dries, under the influence of the burning winds from the Desert; it furrows and cracks, and exudes the drops of gummy fluid, which agglutinate in the form of balls. The hotter and higher are the winds (hindering agriculture), the larger is the product of Gum, and rarely do two unfavourable seasons occur successively. The slaves who collect the Gum, live exclusively upon it, except that quite recently the Arabs have raised some millet for their food in addition. The poor creatures pick it carefully from the bark as fast as it appears, lest any extraneous substance should mix with it; and therefore the best *Senegal Gum* is generally offered for sale in small drops. Each slave sallies out early in the morning, equipped with a leathern bag, which they call a *Toulon* or *Touron*, and carrying a staff, tipped with a kind of hoe or steel blade; but the operation of detaching the Gum is rendered difficult and painful by the sharp thorns which beset the trunk and branches of the *Acacia*-trees. When the *Toulon* is replenished and delivered to the master, the latter always hides it in the sand, to escape the eyes of other gatherers, who, whether friends or foes, would unscrupulously appropriate it; and so the *cache* goes on, till the number of bags is sufficient to be worth carrying to market. If the Gum has been picked too fresh,—that is, with the surface imperfectly dried,—if it lies too long buried, or if rain reaches it, in any of these circumstances, the sand is apt to get into it and to deteriorate the quality. It has been asserted that the masses of Gum sometimes found near and around old trees, caking the earth and impeding the vigorous growth of the stems, are due to exudations from the roots; but I am assured that this idea is now exploded, and that buried Gum is the main cause of them, added perhaps to some which may naturally drop from the trees.

When the slaves have collected sufficient Gum to lade all the camels, oxen, and other beasts of burden of their owner, it is sent to the place of traffic, under the always onerous protection of the chief of the tribe; and is bartered with the French traders for blue cotton cloths, guns, powder, sugar, etc. The sale is compulsory: the traffic can be only effected at an appointed spot, and is superintended by the commandant of a small ship of war; it commences in June and closes on the 1st of August, and takes place at considerable and varying distances up the

river, whence it is conveyed in boats to St. Louis; there it is carefully examined before its despatch to France.

The *Ghioloff Gum*, which comes in very small quantities, is infinitely the finest, the purest, and clearest, with a bright surface, a glassy, almost crystallized fracture, and in large bits. The Moors are so averse to its exportation, that it is only obtainable as a sort of contraband article.

The *Bondou Gum* is very often mixed with the *Galam Gum*, is difficult to be distinguished by sight alone, and baffles the eye of experienced traders, but is recognized by its bitter flavour. It is the produce of an *Acacia*, near *A. albida*.

The *Gonaké* or *Gonaté Gum* (so called from the tree which yields it, and to which the natives give that name) is collected abundantly in the Oasis of El-Fatak. It is redder than the other Gums; but the facility with which it is dried and pulverized affords an easy mode of adding it to the better sorts and adulterating them; and the Moors thus habitually increase the volume and weight of the more saleable gums. The taste alone detects its presence, for it is very bitter. It exudes from *Acacia Adansoni* of the *Senegal Flora* (*Mimosa Gonakié*, Adanson).

The *Friable Gum*, or *Sabra-béida* (corrupted into Salabréda), is offered in the form of a coarse salt; its fracture is glassy, the surface always dull and often wrinkled, and it is found either in rounded tears or in long, vermicular fragments; the flavour is always rather bitter. Its different colours, whitish, red, green, and yellow, depend on the age and strength of the Gum-tree which affords it; the more or less sandy nature of the soil has also a marked effect. It melts readily in its own weight of water, and forms a thin mucilage, which slightly reddens litmus paper. January, February, and March are the times when it is collected, in the forests not far from Bakel; and it is sold by stealth, by the Moors, and as fast as they can gather it, for it will not bear to be buried, like the Gum of *Acacia Verek*. It is produced by an *Acacia*, nearly allied to *A. albida*: the tree is very thorny, much smaller than *A. Verek*, and grows in the sands of the Sahara, near Galam, on the right bank of the river. The white bark gives it the name of *Sabra-béida* (the White Tree); its Gum is very inferior to the Hard Gum, and is never vended at St.-Louis, except when the harvest of Hard Gum fails.

Observations on the Formation of the SEEDS *without the aid of the* POLLEN; *by* M. CH. NAUDIN. (*Communicated by* DR. B. SEEMANN.)

(*From 'Comptes Rendus,'* 1856, vol. xliii. p. 538.)

"The sexuality of plants, now generally admitted, and the part which the pollen plays in the reproduction by seeds, are most prominent points in Vegetable Physiology, and there is therefore no reason to be surprised that one of the greatest naturalists of the last century should have made it the basis of a system of classification for ever celebrated. To Linnæus, and the greatest part of his followers, fecundation by means of pollen was the condition *sine quâ non* of the development of the ovules and of the formation of the seeds. The law appeared absolute and without exception, and the fine experiments of Kœlreuter on Hybrids have not a little contributed to make it accepted rigorously. In our own time it is carried still further: the intervention of the pollen has appeared so sovereign in the act of reproduction, that an entire school, formed in Germany under the inspiration of Horkel, has not hesitated to see in this agent the origin even of the embryo, attributing to the ovule only the secondary part of matrix or organ at once protective and nutritive. This hypothesis, boldly advanced and valiantly sustained, is now almost universally abandoned, even by those who have contended for it with the most talent and *éclat*. I have not here to repeat the numberless embryological researches which, to the great advantage of science, it has given rise to; but I will add, that if they could adduce incontestable cases of formation of fertile seeds without agency of the pollen, we should still have a last argument to oppose to it, and one which would be without reply.

"Now facts exist, and they are not new; but belief in the absolute necessity of the pollen in all possible cases of development of the ovules was so fixed in the minds of naturalists, that these facts have remained in the shade, and have been thought dubious, or else entirely controverted. It appears to me that the moment is opportune to place them in the proper light, and to recall to them the attention of physiologists.

"If I do not deceive myself, it was Spallanzani who, about the close of the last century, pointed out the first exception to the too absolute law of the pollinical fecundation, by announcing that the female Hemp could fructify without the agency of the male. A fact so opposed to

received opinions could not fail to find opposers; but it had also its supporters, among whom we must particularly mention Professor Bernhardi, whose experiments would seem to leave little room for doubt. However, general opinion was still inclined to see an impossibility in fecundity without fecundation; and it has not failed less than the remarkable discovery of John Smith on the *Cœlebogyne* to force stubborn minds to accept as possible and real (at least in some cases) the formation of seeds without previous fecundation.

"I have for two years resumed the experiments of Spallanzani and of Bernhardi, and, like them, I have arrived at the conclusion that the female Hemp can fructify without the participation of the male. A female plant, isolated in the grounds of the Museum, and very distant from some male specimens found in the Ecole de Botanique, furnished me with the first supply of seeds which served for my projected experiments. These seeds, sown in April, 1855, produced vigorous plants, of which twenty females were left in the ground in an enclosure shut in with walls, and separated from the Museum by the Rue Cuvier. Four others, also females, were planted, before any blossoming, in small pots, which I placed in the greenhouse of the Orangery, a garden surrounded with walls on all sides, and containing no other specimen of Hemp. All these plants flourished and fructified. They were frequently inspected, and never did I perceive in them the least trace of male flowers, which was very easy to execute on the four plants in pots, which were left very loose, and were without any ramifications, in consequence of the little nourishment they found in the small clod of earth in which they grew. The seeds of these four plants were gathered singly, and sown this year (1856). I have obtained from them forty plants, of which the males were all suppressed at the first appearance of their buds.

"Four new female plants, placed like those of the preceding year in small pots, were taken into a room situated in the second story of the house occupied by M. Decaisne, and they were there so sequestered that it was absolutely impossible for pollen of their species, or any pollen whatsoever, to have reached them: nevertheless these plants bore fruit. The most scrupulous examination, both of M. Decaisne and of myself, could not enable us to discover a single male flower among the female ones, which they produced in a very great abundance, and of which only a few have borne fruit, now almost ripe.

"The observation of Smith on the *Cœlebogyne* gave me the first idea of noting what would become of isolated female *Mercurialis.* A few very young plants, placed in pots before the appearance of their flowers, were put, some in a greenhouse, others in the small room just spoken of. The precautions were such, especially as regards the latter, that it is impossible to admit they could have received pollen of their species. All these plants, eight in number, produced an immense quantity of female flowers, of which a part, perhaps a fiftieth, bore fruit well formed, and containing seeds which germinated perfectly this year. I can also affirm that these plants did not produce any male flower.

"As a counter-proof to this experiment, I took away from two plants of *Ricinus* (of which one was found near similar plants, and the other distant enough to be considered out of the reach of their pollen) all the male flowers which were there, and which were in different stages of progress. All the female flowers fell off successively, without being able to set fruit; and yet one could suppose, with a certain degree of probability, that the stigmas of one of these two plants might have received some grains of pollen. Here then are three *Euphorbiaceæ,* of which a monœcious one does not fructify without fecundation, and two others, diœcious, in which seeds are formed undoubtedly without the aid of pollen.

"I observed, in 1854, in ground close to a wall and palisades, belonging to the Museum, a female plant of the common Bryony (*Bryonia dioica*), quite alone in this ground, and which, from thousands of flowers which it had produced, had set and ripened fruit in very great numbers, but in a proportion incomparably less than that of the flowers. These fruits contained well-formed seeds. In November of the same year I had fifteen of them sown in a hothouse; all came up very well. In 1855 this female Bryony fructified as it did in the preceding year, and in the same proportion as it had done in 1856. I have examined the flowers many times, and have never found in them any traces of anthers. We may then suppose that some fruits which it produced each year proceeded from fecundations effected by the intervention of insects. What follows will prove that this reason cannot be advanced.

"In April of this year I caused to be planted, in the same border where the Bryony was found, a second female specimen, raised from seeds produced in November, 1854, and which, till then, had remained potted. Doubtless on account of its youth this plant did not develope

much, but it was covered with flowers, which, without exaggerating, I may reckon at many thousands. All were females; in some I perceived not the slightest vestige of anthers, and yet, remarkable to say, all, or almost all, produced fruit now ripe, which gave to the withered branches of the plant the appearance of long red bunches. I took a hundred of them promiscuously, to examine their contents; of this number there was a dozen containing no seeds at all, forty-five with only one, twenty-nine two, eleven three; there were only two with four seeds, and one alone which contained five. This result does not sensibly differ from that presented by the plant which grew close to a male plant.

"Yet while this second Bryony was literally covered with fruit, the old plant, distant from it only a few yards, bore neither more nor less fruit than it did in the preceding years. We cannot say then that in both fecundation may have been effected by insects carrying pollen of the species, since it is evident that they would have equally taken it to both, and that both in consequence would have equally borne fruit. Now, as I have just said, the difference in this respect was enormous. I can only explain it to myself by the particular individual dispositions; in other terms, by veritable idiosyncrasies.

"In order to assure myself that the quality of the diœcious plant has its origin in a measure in the causes of this anomalous fecundity, I made a fair experiment on this point, on a single specimen of *Ecbalium elaterium*, planted expressly in the same enclosure. During more than two months I took away all the male flowers, as the buds made their appearance, in such a manner that none could open and furnish pollen fit to effect fecundation. All the female flowers, to the number of more than a hundred, which showed themselves during the time that the suppression of the male flowers was going on, perished in eight days after their blooming, without their ovary showing the least swelling; but they set their fruit as soon as these continuous castrations ceased. We saw here then repeated that which I have already remarked about the *Ricinus,* the absolute unfecundation of the female flowers, through default of the male flowers, in a monœcious plant, while that another plant of the same Family, and allied by its organization, but diœcious, does not cease to fructify and to produce fertile seeds, even in the entire absence of any male to fecundize it.

"Other facts of the same kind, that I have not myself observed, but which the authority of the name of those who produced them renders

very credible, have been remarked at different periods, and always on diœcious plants. Fresenius affirms ('Linnæa,' 1839) that the *Datisca cannabina*, female, fructifies very well without the concurrence of the male. It should be the same, according to M. Lecocq, with the female Spinach, and, according to M. Tenore, at Naples, with the *Pistacia Narbonensis* (Ann. des Sc. Nat. 4ème série, t. I. p. 328), which Boccone (Museo di Piante, p. 148) affirms equally to have observed on other species of *Pistacia*. Testimonies so numerous and so in accordance scarcely permit the reality of the formation of embryo in plants without the participation of the usual fecundizing agent to be called in question. It remains to be learnt how long the species would be preserved if they were reduced artificially to this mode of propagation. In every case a new view of observations (which it was well to point out) is opened to embryologists."

[That description of generation to which the above detailed cases belong is, in my opinion, best expressed by the term "*Parthenogenesis*," restricted, as has already been done entomologically by C. Th. E. von Siebold, to the development of the ovules without the agency of the male principle, the "*lucina sine concubitu*" of the older naturalists, and not extended, as has been done by Richard Owen in his excellent work 'On Parthenogenesis, or the successive production of procreating individuals from a single Ovum (London, 1849),' to the process of germination observable in certain esexual, viviparous bugs. Simultaneously with Naudin's interesting paper (for the above version of which I must consider myself responsible), there appeared an entomological work, indirectly bearing upon the question, 'Wahre Parthenogenesis bei Schmetterlingen und Bienen, by C. Th. E. von Siebold (Leipzig, 1856),' in which a Parthenogenesis is shown to exist in *Psyche Helix*, *Solenobia clathrella* and *lichenella*, *Bombyx Mori* and *Apis mellifica*; and a paper by Alexander Braun, confirming the Parthenogenesis of *Cœlebogyne*, and showing it to exist in *Chara crinita*, was read at the Meeting of the German Naturalists and Physicians at Vienna, September 18, 1856. Finally, I may be allowed to add that I have reviewed the present state of the whole question in two leading articles in the 'Bonplandia,' January 5 and February 1, 1857.—*Berthold Seemann.*]

BOTANICAL INFORMATION.

Fendler's Venezuela, *and* Wright's Cuba Plants.

In no country in the world, perhaps, are botanical collections more extensively made and better prepared (and we may now add, better described) than in the United States: and the collectors have proved equally efficient abroad as at home. Two botanists, whose names head this article, after enriching the American Flora by their travels and discoveries in those new Territories which have recently, and happily for the Colonists there, become a part and parcel of the United States possessions, are now prosecuting their researches in more southern latitudes.

1. Mr. Fendler, now we believe a resident at "Colonia Tovar, in Venezuela," has already sent some beautiful sets of the Phænogamous Plants and Ferns of that highly interesting country, to the care of Dr. Asa Gray, Professor of Botany in Cambridge University, Massachusetts, U. S., and which that gentleman kindly undertakes to dispose of for behoof of Mr. Fendler. Of these all are disposed of, excepts four sets, numbering respectively 538, 503, 452, and 414 species. Mr. Fendler continues to collect in Venezuela, and can be written to at the above-mentioned address by any who desire to communicate direct with him. We may observe that all the sets are peculiarly rich in Ferns, nearly two-fifths being of that favourite Family of plants.

2. Mr. Charles Wright, on his late return from Ringgold's and Rogers' celebrated United States North Pacific Expedition, where he was employed as botanist, has sailed for and arrived at St. Jago, at the eastern and mountainous extremity of the great island of Cuba, there to devote his whole time to the exploring that totally unknown, and, we cannot doubt, that fertile district, where the mountains attain an elevation of 8000 feet. A Flora of the Island of Cuba has indeed been commenced by the late Achille Richard, in 1845, from the collections of M. Ramon de Sagra, but was suddenly discontinued at the conclusion of the first volume, which includes only the "Dicotylédones Polypétales," and is accompanied by an expensive atlas of plates, many of which are not described. A separate volume indeed on the *Cryptogamia*, by the excellent Montagne, appeared, bearing date 1838–1842. The Author, in the Preface, here observes, "que toute la partie

orientale de l'Ile, à partir du 83° longitude occidentale du méridien de Paris, jusqu'à la pointe de Maysi, extrémité orientale de Cuba, a été peu ou point visitée par les naturalistes."—What may not then be expected from so excellent a collector as Mr. Charles Wright?

NOTICES OF BOOKS.

De Candolle: *Prodromus Systematis Naturalis Regni* Vegetabilis. Pars XIV. sectio prior, *sistens* Polygonaceas, Proteaceas, *aliosque minores Ordines* Monochlamydearum.

The successive appearance of the volumes of De Candolle's 'Prodromus' mark as many epochs in the progress of Descriptive Botany. Ever since the publication of the first volume, botanists have felt its influence in many ways; the fact of such or such a Natural Order being about to be taken up by the contributors to the 'Prodromus,' caused the postponement of the labours of others who were preparing to publish upon it, and in very many instances determined the destination of extensive collections which might otherwise have remained unpublished to this day. Nor has its influence been less directly felt after the appearance of each Natural Order than before it, for it seems to put for the time a check to progress in the field it has occupied: if the monographs have been well done, there remains for a period comparatively little to add; if ill, the confusion is so great that it will take many years and a careful study of the same materials from which they were elaborated, to restore order; and before this is accomplished, any partial attempts to elucidate the subject very generally add to the confusion.

Fortunately for botanical science, the honour and labour of carrying on the 'Prodromus,' since the death of its illustrious projector, has fallen into the hands of able and conscientious workers more often than the contrary; and it is no small tribute to the goodness of the whole work, that few or no better monographs of any extensive Orders, not hitherto included in it, have appeared during its progress than those which itself contains. Amongst the very best of these are two which have just appeared in the first part of the fourteenth volume, namely the *Proteaceæ* by Meisner, and the *Polygoneæ* by Meisner and Bentham,

the former botanist contributing the bulk of the Order, and the latter the Suborder *Eriogoneæ*.

To give a matured opinion of the execution of such great labours as these, is obviously impossible without a somewhat detailed study of the plants themselves with the work in our hands; and we can therefore do no more than give our reasons for entertaining no doubt that these mongraphs are first-rate contributions to the science of botany. These are, the established high reputation of the authors, as careful, diligent, acute, and conscientious naturalists; their extensive general acquaintance with plants and botanical literature; the excellence of Meisner's previous monograph of *Polygoneæ*, published in 1826; of Bentham's monograph of *Eriogoneæ* in the volume of the 'Linnæan Transactions;' and the fact that these authors have availed themselves of all the materials within their reach for rendering their several contributions complete, by visiting the principal European herbaria, and, when possible, by borrowing materials for study. And since, even with such qualifications, much excellence in systematic botany cannot be attained without a long course of study, we may add that we believe that Mr. Meisner has been studying the *Polygoneæ* for now upwards of thirty years; and it is more than seven since he took the *Proteaceæ* in hand. Considering how extensive our herbaria now are, and how good a use has been made of the portions now elucidated, it is but reasonable to suppose that the present volume of the 'Prodromus' will enjoy a more lasting value even than any of its predecessors.

Amongst the more remarkable features of the volume before us are the great size of the genera; and it is with extreme satisfaction that we find these, which are eminently natural, kept entire. Thus of *Eriogonum* there are 80 species, of *Rumex* 130, of *Polygonum* 215, *Coccoloba* 82, *Myristica* upwards of 80, *Leucadendron* 50, *Protea* 61, *Serruria* 52, *Persoonia* 69, *Grevillea* 176, *Hakea* 115, *Banksia* 58, and *Dryandra* 52. Altogether there are just 90 genera, and on an average 20 species to a genus; there being somewhat more than 1800 defined species in the volume. That this proportion is remarkable is proved from Steudel's 'Nomenclator,' where, though the number of species is greatly exaggerated in proportion to the genera, it would appear that amongst all flowering plants there are only about eleven or twelve species to a genus.

Though the proportion of species is so large, we by no means imply that these are exaggerated; the number of new ones proposed is com-

paratively very small indeed, and, as far as we can judge, does not exceed a few per cent. of the whole; whilst, on the other hand, a copious list of synonyms follows very many of the species. Of varieties there are extremely few, and we consequently rarely find a species pronounced as possibly or probably divisible into two, whilst we often find, especially in *Proteaceæ*, species pronounced as dubious, and only retained in the absence of materials sufficient to warrant their incorporation with others. On the other hand are numerous, quite recent, very extensive accessions to the *Proteaceæ* from Australia, and *Polygoneæ* from India, which have been partially examined by us, but not seen by Meisner, would seem to show that there is comparatively very little to be added to his labours, of available materials.

Altogether there are in the present volume about 600 species more than are enumerated in Steudel's 'Nomenclator,' published about fifteen years ago; this increase is almost entirely due to the vast numbers of *Proteaceæ* discovered in South-western Australia by Drummond, Preiss, and Roe, and to the *Eriogoneæ* collected by the American Expedition across the Rocky Mountains. With regard to the future of these Orders, now brought up to the present state of science, we should expect some additions still to be made to the *Proteaceæ*, these plants being so local that there not three species common to South-eastern and South-western Australia, and there being large intermediate unexplored tracts where they no doubt abound; there are also species to be discovered in New Caledonia, the New Hebrides, and other oceanic mountainous islands, and possibly a few in tropical and extratropical Southern Africa. On the other hand, so many of the species described are from solitary fragments of individuals, and these often of large bushes and trees, which present a different foliage at different ages, that a very appreciable proportion described as distinct will no doubt be reduced, besides most of those of whose validity Meisner is already doubtful. The *Eriogoneæ* also will be considerably enlarged, their species being local and the tract of country over which the Suborder ranges being also extensive and very partially explored; and comparatively few of the species now described will be reduced. We suspect that the series of other genera of *Polygoneæ* will be very largely reduced; and of this surmise more copious specimens than Meisner has examined of the Australian *Rumices* and *Polygona*, and more especially of the Indian ones, to which we have paid some attention in a living state, assure us.

It remains to add a few words, and these wholly in praise of the details of execution of the descriptive matter; the generic and specific diagnoses are as short as is consistent with the plan of the work, and the habitats are carefully and correctly selected and arranged,—a very important point, too often slovenly performed in systematic works. We could have wished that the uniformity of the typography of previous volumes of the work had been so far broken into as to have allowed of the habitats, at any rate, being printed in Italics: this, and the same or a different type for the names of the principal organs introduced in the generic characters and descriptions (as *Calyx*, *Corolla*, etc.), would save much time and no little fatigue of eyesight to the reader; these may appear trifles, but in reality they are matters of great importance, now that the number of species is so vast, and the time and difficulty of indentifying them by descriptions so greatly increased.

BONPLANDIA: *A Botanical Journal. The official Organ of the Imperial Leop. Carol. Academy. Edited by* WILHELM E. G. SEEMANN *and* BERTHOLD SEEMANN. Hanover, Rümpler; London, Williams and Norgate; Paris, Klincksieck. (Semi-monthly, with Illustrations.)

The plan of this Journal has undergone considerable change since noticed by us in our volume of 1852. The 'Bonplandia' was then mainly devoted to Economic Botany, but after the first six months of its issue, this exclusive tendency was given up, and articles on all branches of botany were freely admitted. The effect of that change was an immediate increase, which has ever since been going on to such an extent, that instead of the one sheet promised in the prospectus, we have now not unfrequently three, four, and even *six*, and instead of the few original contributors, of no less than sixty, amongst them such names as those of Humboldt, Bonpland, Reichenbach fil., Miquel, Hasskarl, Göppert, Grisebach, Klotzsch, Schultz Bip., Steetz, W. Hofmeister, Caspary, Liebmann, Nees von Esenbeck, Oersted, Lehmann, and others.

Of the Physiological papers particularly deserving of mention, are:—W. Hofmeister, "On the Germination of *Botrychium Lunaria.*" Ejusd. "On the Emoryogenesis of Phanerogams (embracing the latest views of the author, and a critical examination of the writings of Radlkofer and Tulasne on that subject)." Ejusd. "A new Theory on the Impregna-

tion of Phanerogams" (being a refutation of the hypothesis proposed by Schacht, after Radlkofer had demonstrated the groundlessness of his and Schleiden's opinion on the subject). Caspary, "On the Development of Heat in the Flowers of *Victoria regia* and other Plants" (the most elaborate treatise that has ever appeared on these phenomena); there are also all the articles that have hitherto appeared in various periodicals and transactions, on the much-discussed *Ægilops* question, together with several original ones by Regel in St. Petersburg, aud Klotzsch in Berlin.

Of systematic papers we have a great many of permanent value. We would draw particular attention to those of Reichenbach, fil., on *Orchideæ*, scattered throughout the four volumes that have hitherto appeared,—in which we find more than 500 *Orchideæ* (the collections of Schlim, Warszewicz, Wagener, Sartorius, Hance, Ruiz and Pavon, etc.), carefully described, constituting one of the most valuable contributions to that branch of botany; Miquel's "Synopsis of the *Araliaceæ* of Dutch India," Liebmann's "New Mexican Oaks," Seemann's "Review of the genus *Tanæcium*," Schlotthauber's "Enumeration of the *Droseraceæ* and *Utriculariæ* of South-western Australia," Körnike's "Botanical Sketch of Calumet, Wisconsin, United States" (with a synopsis of all the plants of that district, and a review of the genus *Agrimonia*). Besides these articles, and others too numerous to mention, there are also translations of important articles from foreign periodicals, among which we quote as an illustration, Bentham's famous review of the *Loganiaceæ*, lately published in 'The Journal of the Proceedings of the Linnean Society of London,' reviews of new works, miscellaneous notices (original and selected), and all the botanical news, derived both from original sources, and all other periodicals devoted to botany.

Every number opens with a leader on some prominent topic of the day, always written with great fairness and impartiality, further secured to the interested parties by a part of the paper set aside for the sole purpose of giving every one an opportunity of pleading his own cause, without the least restriction on the part of the editors. Most of the articles of the 'Bonplandia' are in German, the systematic articles in Latin; but communications made in other languages are also admitted, as we find several English and French inserted.

On the 15th of January, 1857, the 'Bonplandia' commenced its

fifth volume, and may therefore be looked upon as permanently established, and as having taken a lasting place among the great scientific periodicals of the day.

LEHMANN, CHRISTIANUS; *Revisio* POTENTILLARUM *Iconibus Illustrata.* (From the Supplement of the twenty-third volume of the Nov. Act. Acad. Nat. Cur.) 4to, with Sixty-four Plates. 1856.

This is a very acceptable work to the practical botanist, for the genus is one which, like *Hieracium*, or its much nearer allies, *Rubus* and *Rosa*, is attended with great difficulty in determining the limits of the species: "in genere tam difficili limites inter species ægerrimè statuuntur." Dr. Lehmann however does not enter upon a field that is new to him. He is a veteran in the study of the *Potentillæ*, and no man has worked more zealously upon any genus of plants than our friend has upon this. Besides elaborating the rich collection of species for Hooker's 'Flora Boreali-Americana,' we have from his pen the 'Monographia Generis Potentillarum,' published in 1820, with twenty plates, and a supplemental fasciculus in 1835, with ten plates. Since that period the labours of botanists have brought to light several new species; and the whole are here incorporated in one work, with no less than sixty-four beautiful *additional* plates, with, not unfrequently, two species represented on one plate. The greatest pains seem to be taken in the arrangement, in the drawing up of the specific distinctions, and in the very copious synonymy. Observations are given where necessary, and references to the author's more full descriptions in his previous publications. In so very difficult a genus we cannot be too thankful to Dr. Lehmann for giving us so many figures as he has done. Other works, especially local floras, and even garden-books, have not been backward in publishing figures of *Potentillæ*; but it is chiefly owing to the very numerous, and we think we may say very accurate ones, of this author, that out of 201 species here given, only 21 remain unrepresented by a figure.

At the close of the volume are five large, folded, elaborate Tables, explaining at a glance the geographical distribution of the several species. From these it appears that *Potentilla reptans* and *P. anserina* are the most widely dispersed, and the latter and the *P. Norvegica* (both unquestionably wild), are the only ones found in Australia.

On Ranunculus Creticus, cortusæfolius, *and* grandifolius *of Authors; by* R. T. Lowe, M.A.

Considerable uncertainty seems, from their first discovery, to have attended the right determination of the common large Canarian and Madeiran species of *Ranunculus.* The original specimens sent from both these localities by Masson, in 1776 and 1778, and still existing in the Banksian Herbarium, were indiscriminately referred by Dr. Solander to *R. Creticus*, L. Persoon however in his 'Enchiridium,' or 'Synopsis' (Paris, 1805–7), under the name of *R. Teneriffæ*, and Willdenow, in his 'Enumeratio' (Berlin, 1809), under the name of *R. cortusæfolius*, described the Canarian plant as a distinct species; and this determination, though indorsed by De Candolle, in his 'Systema' and 'Prodromus,' under the name conferred by Willdenow, and illustrated no less by the publication of the admirable figure in Delessert's 'Icones,' i. t. 36, than by the full discriminative and exact description in the 'Phytographia Canariensis' (though his var. β may perhaps be the true Madeiran plant) of my late lamented friend Webb, seems still not to have commanded complete acceptance, though more perhaps from certain theoretic views than from absolute practical study of the plants in question. It seems to be still more strongly doubted whether the Madeiran plant, first published by myself, in 1830, under the name of *R. grandifolius*, may not be considered as a form or state of one at least of these two species, to both of which it is undoubtedly no less closely allied in physico-botanical, than it is to the Canarian plant, in geographical, affinity.

The result of a protracted correspondence on these points some years ago (in 1844), with another much-regretted friend, the late Dr. Charles Lemann, was an acquiescence in his opinion, formed (as he wrote April 10, 1844), "with Webb's work before me, and dried specimens of the *Ranunculus* from the Canaries, Madeira, and Azores," and confirmed by his subsequent examination of the Hookerian Herbarium, that *R. cortusæfolius*, Willd. and Webb, was indeed distinct; but that *R. grandifolius* was identical with *R. Creticus*, L.

Subsequently (in 1846) Dr. Lemann seems to have become again unsettled, and to have reverted to Solander's original reference of the Canarian as well as the Madeiran plant to the Cretan species.

Unprepared to accept this, though I had acquiesced (see 'Primit.

Faunæ et Fl. Mad.' ed. 2, 1851, App. pp. v. vi.) in Dr. Lemann's earlier view, which had been indeed my own, I have lately, by the kind favour of Mr. Brown and Sir W. J. Hooker, carefully re-examined the whole of the ample materials for the elucidation of the question contained in the Banksian and Hookerian Herbaria, enriched as they are now by fresh and more abundant specimens of the Cretan and Canarian plants, from De Heldreich and E. Bourgeau, than Dr. Lemann had the advantage of comparing. And having arrived at the conclusion that both *R. cortusæfolius* and *R. grandifolius* are alike distinct from each other and from *R. Creticus,* L., I shall proceed to give their diagnoses, with a brief synonymy and history of each species, taking them in the order of their first establishment.

R. Creticus, *L.*

R. molliter tomentoso-villosus, pilis lanuginoso-sericeis simplicibus, caulinis patentibus superne erecto-patentibus; fol. mollibus immaculatis, radicalibus reniformibus incisis late parciusque vel remote grossicrenatis, caulinis profundius pinnatipartitis sessilibus, laciniis integris; fl. sparsis remotis distinctis; sep. patentibus; spicis majusculis ovali- vel ovato-globosis crassis abbreviatis obtusis, ach. magnis nunc glabris nunc hispidiusculis.

Hab. In Ins. Creta.

From specimens in the Banksian and Hookerian Herbaria, from Gouan, Sieber, and De Heldreich. A specimen from "Rhodes, Aucher-Eloy, Herb. d'Orient, No. 32," in the Hookerian Herbarium, is much less hairy than usual; but it is altogether a poor, weak, drawn-up plant, grown evidently in a shady spot, or amongst other herbage.

Root fasciculate or tufted, like that of the common garden *Ranunculus* (*R. Asiaticus*, L.), the tuberous divisions slender, not fleshy, thick or palmate. Stem 6–12 inches long, somewhat weak and declining, sparingly branched, few-flowered. Lower leaves light green, immaculate, broader than long, 2–4 inches broad, with a wide, open sinus at their base, the petioles densely villose, like the stem, with soft, cottony, spreading hairs. Flowers not at all corymbose, of moderate size, scarcely larger than in *R. acris*, L., or *bulbosus*, L. Spike resembling neither that of the Canarian nor Madeiran plant, *i. e.* much shorter and thicker than in the former, and larger than in the latter, with the achænia larger than in either.

Stem-leaves pinnatipartite, often three-cleft, nearly or quite sessile, the divisions linear or lanceolate; uppermost leaves simple, lanceolate or linear entire. Sepals horizontally spreading. Receptacle more or less villose at the base of the spike. Beak of achænia hooked. In these four points there is no constant or marked difference between the present plant and the two following. They are here added therefore once for all.

In habit, size of parts and stature, this species resembles much more the Canarian than any form or state of the Madeiran plant. This is perhaps conformable to the greater dryness of the Cretan and Canarian, compared with the Madeiran climate, however disaccordant with the geographic station of the plants.

In the Appendix to the second edition of 'Primitiæ Faunæ et Floræ Mad.,' I was induced by the observations of my late friend Dr. Charles Lemann, made in 1844, to refer the Madeiran *R. grandifolius* to this species. But after recent careful re-examination of the very same materials in the Banksian and Hookerian Herbaria, on which he formed his opinion, with later additions of importance, I am constrained to draw a different conclusion. *R. Creticus*, L., differs from *R. grandifolius* in its altogether smaller size, humbler stature, weaker, more slender habit, more copious, softer, spreading, cottony pubescence, smaller, reniform, softer, coarsely and remotely inciso-crenate leaves, with few, short, broad, bluntish or rounded teeth or lobes, smaller, fewer, not corymbose flowers, larger spikes and achænia (the latter often hispid), and tufted, not palmate root, with slender instead of fleshy, thick divisions: approaching in fact nearer to *R. cortusæfolius*, Willd., though certainly distinct from that species by its copious, soft, villose pubescence, simple, not bulbous, cottony or silky, not substrigose or setose hairs, light green, unspotted leaves, and remarkably short, thick, globose-ovate or oval spikes, with larger achænia.

R. Creticus, L., should be placed between *R. cortusæfolius*, Willd., and *R. grandifolius*: both of these being more nearly allied to it than to each other.

R. CORTUSÆFOLIUS, *Willd.*

R. sparsim parciusve substrigoso-pubescens, pilis subsetosis brevibus rariusculis, caulinis patentibus superne erecto-patentibus, foliorum præsertim bulbosis; fol. submembranaceis sæpius nigro-maculatis,

radicalibus reniformibus incisis late parciusque vel remote grossicrenatis, caulinis 3–5-partitis, summis sessilibus simplicibus lanceolatis integerrimis; fl. sparsis remotis distinctis, pedicellis gracilibus elongatis; sep. patentibus; spicis cylindrico-oblongis; ach. plerumque sparsim hispidis.

R. *cortusæfolius*, Willd. Enum. 588; DC. Syst. i. 264; Prodr. i. 29; Deless. Icon. i. t. 36 (opt.).

R. *cortusæfolius*, *α*, *rupestris* (vix *β*, *sylvaticus*, nisi partim fortasse), Webb et Berth.! Phytogr. Canar. iii. (part. 2) 8, 9 (descr. opt.).

"R. *Teneriffæ*, Pers. Ench. 2, 103," DC. Webb l. c.; utroque ad var. suam *β* (omnino diversam) referente.

Hab. In Ins. Canariensibus "in rupestribus graminosis regionis sylvaticæ Teneriffæ, Canariæ et Palmæ, etc.," Webb.

From Canarian specimens in the Banksian and Hookerian Herbaria, from Masson, Webb, Bourgeau, etc.

Root small, fascicled, with slender, tuberous divisions, as in *R. Creticus*, L. Stem 6–18 inches high, erect and branched, but scarcely corymbose, few-flowered, the whole habit altogether more slender than in *R. grandifolius*, and more like that of *R. Creticus*, L. Lower leaves "dark green," Webb, generally spotted with clear, defined, small, angular, black specks or dashes, but sometimes quite immaculate, broader than long, not above 3 or 4 inches in diameter, and though of thinner texture, yet in shape as well as size and crenation much resembling those of *R. Creticus*, L., differing however in their distinctly bulbous hairs, most conspicuous on their upper surface. Petioles clothed, like the stem and pedicels, with spreading hairs, which are rather callous-swollen than distinctly bulbous at the base. Flowers not corymbose, but few and scattered, as in *R. Creticus*, L., larger however than in that species (*i. e.* 1–1½ inch in diameter) with much more slender, elongated pedicels. Spike always distinctly oblong, viz. 6–7 lines long (N.B. Webb, by a misprint or slip in his description, has 6 poll. for 6 lin.), and 2–4 lines broad. Achænia, especially the lower, almost always sprinkled with short, thick, glandular hairs, but occasionally in robuster plants almost or quite smooth.

Webb having already well and fully pointed out the distinctive characters of *R. cortusæfolius*, compared with *R. Creticus*, I shall confine myself to those by which it is to be distinguished from its less near ally *R. grandifolius*.

Compared with *R. grandifolius*, *R. cortusæfolius*, Willd., is distinguishable to the eye at once by its altogether less robust, stiff, coarse and hairy, in fact, somewhat comparatively delicate and slender habit, resembling rather that of *R. acris*, L., or *bulbosus*, L., its more stiff or strigose, shorter, thinly sprinkled, spreading hairs, those of the leaves being distinctly bulbous, its smaller leaves less stiff and coarse in texture, crenate, with few broad, blunt teeth or lobes, and generally speckled with black, its smaller, fewer, remote, not crowded, corymbose flowers, on long, slender, thin stalks, its fruit-spikes always cylindric-oblong, with the receptacle thickly hirsute at the base, and the achænia mostly subhispid or sprinkled (especially the lower) with a few short, scattered, coarse, subglandular hairs. The root is also smaller, with less thick or fleshy divisions, fascicled in a close, round tuft or bundle, and not compressed or palmate.

Nothing like *R. cortusæfolius*, Willd., as here restricted, has ever occurred in Madeira, either to myself or to any other botanist of my acquaintance. There exists however in the Banksian Herbarium an undoubted specimen of the plant, marked "1. Madeira, Fr. Masson," pasted on the same sheet with another specimen, marked "2. Teneriffe, Fr. Masson, 1778;" the whole sheet thus occupied having been subsequently marked by Professor De Candolle, prior to the publication of his 'Systema,' in his own handwriting, "*R. cortusæfolius*, W., *β*, *Teneriffæ*, Pers.," although the upper stem or floral leaves are entire in No. 2 only. The habitat, Madeira, affixed to No. 1, I cannot but regard however as a mistake, arising from some accidental interchange of specimens or tickets, possibly by Masson himself, who botanized in Teneriffe after Madeira.

R. cortusæfolius, *β*, *Teneriffæ*, DC., if resting on no better authority than the above No. 2, is a very slight form or variety indeed, and scarcely worth distinguishing. The spikes in this specimen are however more slender or linear-oblong (being only 2 lines broad and 6 long), than in any other specimen observed. It consists merely of the upper part of the plant or portion of a panicle (not corymb). The lower leaves are wholly wanting, but the hairs are bulbous on the rest, and the plant undoubtedly is nothing but a trifling form or state of the true *R. cortusæfolius*, Willd., of Teneriffe.

On the other hand, it may be reasonably doubted whether *R. cortusæfolius*, *β*, *sylvaticus*, Webb, be really a Canarian plant at all; and I

am strongly inclined to suspect that it was rather constituted chiefly, if not wholly, by its author, on his notes or recollections merely of the Madeiran *R. grandifolius*, gathered, as he says, with me in Ribeiro Frio in 1828; for if founded with Madeiran specimens before him, he could scarcely have passed over without notice the soft, silky, adpressed, not patent, strigose, or bulbous hairs, on which he dwells so much in his description, and other points at variance with his own exact account of the Canarian plant, nor have placed silently *R. grandifolius* as a synonym to the latter. And it is even more improbable, that had he possessed a genuine Canarian specimen, really agreeing with the Madeiran plant, that he would have constituted with it his var. *β*, without observing its essential difference from *α*. His characters, synonymy, and remarks on *β*, are, in short, alike consistent with the idea that it was founded rather on imperfect notes or memory than on specimens, though it may possibly have been intended also to include some large, luxuriant state of the true Canarian plant; and it is very remarkable, in confirmation of this view, that neither in the Banksian nor Hookerian Herbaria are found Canarian specimens from either Webb himself, or Bourgeau, or any other person, even purporting to be *R. cortusæfolius*, *β*, *sylvaticus*, of Webb.

R. GRANDIFOLIUS, *Lowe*.

R. subvilloso-pubescens hirsutiusculus, pilis sericeis simplicibus, caulinis adpressis; caule plerumque robusto erecto elato ramoso corymboso multifloro ramis patentibus subdivaricatis; fol. rigidiusculis subcoriaceis immaculatis, radicalibus 2 v. 3 amplis orbiculato-reniformibus, sæpius subindivisis v. obtuse inciso-lobatis rarius pinnati-partitis, acute tenuiterque crebridentatis; caulinis 3–5-partitis, summis sessilibus simplicibus lanceolatis integerrimis; fl. dense corymbosis magnis, sep. patentibus; spicis abbreviatis obtusis globoso-ovalibus raro oblongis; ach. glaberrimis.

α. major; caule robusto elato 2–4-pedali; fol. lucidis radicalibus amplissimis 5–12 poll. latis orbicularibus subindivisis obtuse lobatis nec partitis; corymbo vasto multifloro, fl. maximis; spicis ovali-globosis.

R. grandifolius, Lowe! Prim. (Edit. 1. 1830) 38, non Meyer; Walp. Repert. 1. 36.

R. Creticus, Lowe! Prim. (Edit. 2, 1851) App. v. vi., non Linn.

R. Creticus, Solander in Herb. Banks.! non Linn.

R. arcticus (misprint for *creticus*), Buch! Verzeichniss, 195, no. 300.

R. cortusæfolius, β. sylvaticus, Webb et Berth. Phytogr. Canar. iii. part 2, 8?

R. cortusæfolius, β. sylvestris, Seub. Fl. Azor. 42.

R. cortusæfolius, Hook. Bot. Mag. t. 4625! (hairs too spreading: description in part only), not Willd.

R. megaphyllus, Steudel.

Hab. In rupibus convallium (Rib. Frio, Rib. da Metade, de Fayal, de Seisal, Serra d'Agoa, Boa Ventura, etc. etc.) Maderæ, ad alt. 2000–5000 ped. ubique.

From Madeiran specimens in the Banksian and Hookerian Herbaria, from Masson, Lowe, Lemann, Vogel, etc., and from my own notes and observations in Madeira on the spot.

In its normal state, *a*, this is a very striking, large and handsome, though somewhat coarse, rough, hairy plant, of almost gigantic size and stature in its genus, and of a noble appearance from its ample, bright-green, shining leaves, and very large, broad, crowded corymb of numerous, large, handsome flowers, like enormous Buttercups, conspicuous at considerable distances on the ledges, or within the clefts of high rocks or cliffs in the ravines, which is their usual place of growth. —Root very large, often (but not constantly) palmate or subpedate, with large, thick, fleshy, tuberous divisions, which are mostly smooth or naked. Stem from 2 to 4 feet high, or even more, and often as thick as the little-finger, stout, firm, succulent, very erect and straight, much branched upwards, the branches stiffly patent, clothed like the stem with almost always close-pressed, opake, soft, simple hairs, varying in quantity and length. Leaves of a peculiar light yellow-green, shining, though clothed all over, generally copiously, with simple, never bulbous, hairs, always immaculate, of a somewhat firm or rough, strong stiffish feel or substance: the lowest two or three, of great size and beauty, more or less incised between the five or six broad round shallow lobes, but appearing undivided and simply orbicular, or reniform: their edges finely and numerously cut, with fine sharp teeth: their petioles often a foot long, clothed with adpressed hairs, and with the sheaths at their base equally hairy. Flowers rather sweet-smelling, densely corymbose and numerous, very large, $1\frac{1}{2}$–$2\frac{1}{2}$ inches in diameter, the petals being 1–$1\frac{1}{4}$ inch long, bright, full golden shining yellow. Sepals softly-hairy, very concave, horizontally patent, not reflexed, the edges of the

outer scariose. Spikes short, oval, or globose, never, as far as I have observed, distinctly oblong. Achænia quite smooth, with a hooked beak. Receptacle slightly hairy at the base.

The following aberrant form or state, β, is only found either on very moist grassy banks, or by streams and in thickets at high elevations, and subject in both cases to almost constant damp or moisture. Its main characteristics therefore. of humbler stature, more divided foliage, and greater hairiness, under these circumstances, are directly contrary to the usual effects of greater humidity on individuals of the same species. Still the intermediate links of the two forms, α and β, are so close and numerous as to forbid their further separation. The latter is thus characterized:—

β. *minor;* humilior, plerumque villosior; caule 6–24-pollicari sæpius pedali minus ramoso; fol. radicalibus minoribus 2–4 poll. latis pinnatipartitis sc. profundius divisis et incisis; corymbo paucifloro; fl. paullo minoribus; spicis aliquando oblongis.

? "*R. Creticus*, var. *macrophyllus*, Lindl. Bot. Reg. 1432."

From Madeiran specimens in the Hook. Herb. from Lowe, Lindley, etc., and one Azorian (Caldeiras, Fayal, 1838) from Guthnick and Hochstetter, and from my own original descriptions taken in Madeira on the spot.

Root fasciculate, tufted, like *R. Asiaticus*, L., the tuberous divisions more or less tomentose. Stem erect, from 6 to 12 inches high, in more luxuriant plants from 1 to 2 feet high, its base often purplish, clothed throughout, and thickly in the smaller forms, with white or hoary, silky (not pellucid), close-pressed hairs. Root-leaves generally two, rarely three, deeply laciniate or cleft into five principal lobes, the narrowish divisions sharply cut and toothed, on both sides densely hirsuto-pubescent, the hairs quite simple; petioles 2–4 inches long, and with their sheaths hairy, the hairs generally adpressed, sometimes patent. Flowers few, but corymbose, 1–2 inches in diameter. Sepals softly villoso-pubescent, filmy at the edges, concave, horizontally spreading, not reflexed at any stage. Petals bright, full golden shining yellow. Spikes globosely oval, sometimes approaching to oblong, occasionally (in the Paul da Serra plant) distinctly oblong, viz. 6–9 lines long, and 3–4 lines broad. Achænia quite smooth, with a hooked beak.

There are two forms or subvarieties of β, one taller and less hairy, from the Paul da Serra chiefly; the other more villose and of generally

lower stature, occurring on grassy banks near the foot of the waterfall in the Ribeira de Santa Luzia.

I regret my inability to verify the reference to t. 1432 of the 'Botanical Register;' but, from the existence of two apparently garden specimens in the Hookerian Herbarium on the same sheet, one being the Paul da Serra taller state of β, the other the smaller, more villose Ribeira de Santa Luzia form, marked "*R. grandifolius*, Lowe, Madeira, Dr. Lindley," the above synonym most probably belongs to one or the other of these forms of β.

The synonym of Seubert's 'Flora Azorica' belongs certainly to α; but the single, remarkably shaggy Azorian specimen from Guthnick and Hochstetter, in the Hookerian Herbarium, as certainly belongs to β.

T. 4625 of the 'Botanical Magazine' well represents the normal state, α, of the Madeiran plant, except the erecto-patent hairs, which are at variance not only with its usual aspect, but with the original particular specimen itself, happily preserved in my kind and valued friend's magnificent Herbarium. Still in the native plant I have occasionally met with a few rare, and, as it were, accidental instances of variation from the almost constant close-pressed character of the cauline hairs; and they may have possibly become more close-pressed in the dried than in the recent plant. The uncoloured spike also on the right-hand side of the plate is more distinctly oblong than I have ever noticed it to be in α, and might have been sketched in from a specimen of *R. cortusæfolius*, Willd., not separated in the Herbarium from *R. grandifolius*. The description has been principally drawn up from the plant figured, except "hairs dilated at the base," and "laterally hairy ovary;" characters which, neither existing in the Madeiran plant, nor in the original specimen here figured, can only have been taken from some specimen of the true *R. cortusæfolius*, Willd.

R. grandifolius, in its normal state, α, is at once distinguished from both *R. Creticus*, L., and *R. cortusæfolius*, Willd., by its great size, large foliage and flowers, coarser, more robust, stout habit, and close-pressed pubescence. The sharply-toothed, not crenate root-leaves, close-pressed pubescence of the stem, corymbose inflorescence, and always smooth achænia, again distinguish it in both its varieties from the same plants; and it differs further from *R. cortusæfolius*, Willd., in its never bulbous hairs or spotted leaves, and rarely oblong fruit-spikes. In β, as to size and stature, it approaches nearest to *R. Creticus*, L., but the sharply

cut and toothed root-leaves, the close-pressed, however copious, hoary or silky pubescence of the stem, and smooth achænia, remain to mark it; and whilst it is certain that β is a mere form of α, it is equally certain that it is not one caused by a drier soil and climate, such as that of Crete, but the reverse. Let it be noted well, that even the smaller, more villose states of β, which most seem to approximate towards *R. Creticus*, L., are from much moister situations than those in which α usually occurs, growing at an altitude of nearly 3000 feet above the sea, on a grassy bank a little below a waterfall of 600–800 feet, at the head of a narrow gorge or ravine of enormous depth, exposed to perpetual spray, and with only five or six hours' sunshine in the height of summer; whilst the other taller form, less hairy perhaps, but with equally divided leaves, is found on the flanks or summit of the lofty Paul da Serra, by streams or in thickets, at an elevation of above 5000 feet, bathed in almost continual mist and vapour for at least three-fourths of the year. Thus β does not owe in any case its more divided leaves, smaller stature, and greater villosity to a drier soil or climate, for it occurs only in a moister and a colder. And thus, that state of *R. grandifolius* which appears in form and aspect nearest to the Cretan species, is precisely that which, in the conditions of its place of growth as to humidity, most differs from it.

If indeed the Madeiran plant were found to increase in resemblance to the Cretan, as it grew in a drier soil or situation, some presumption would be afforded for considering it to be a mere local form of the latter species. But the contrary is the case. I have frequently transplanted α to my garden at the Valle or the Levada de Santa Luzia, the one about 400, the other about 600 feet above the sea, from Rib. Frio and elsewhere; and notwithstanding the great comparative deficiency of shade and moisture, they have constantly retained all their peculiar characters.

I have never seen a native genuine specimen of *R. grandifolius* from any other country than Madeira or the Azores.

The question of priority between *R. grandifolius*, Lowe (Prim. ed. 1, Nov. 1830), and *R. grandifolius*, C. A. Meyer in Ledebour's Flora Altaica, vol. ii. 1830, cannot well be settled. The name however has been long very generally associated with the Madeiran plant; and in the absence of clear proof that it belongs to the other, it seems better to retain it for the same, and to call the Altaic plant *R. Meyeri*, after its first describer.

I take the opportunity of adding that I have discovered my *Spergularia* or *Lepigonum fallax* (Journ. of Botany, viii. 289, 290), to be *Arenaria flaccida* of Roxb. Fl. Ind. ii. 447; and that the plant appears, from specimens in the Hookerian Herbarium, to be a common weed in India, the Himalaya, etc., as elsewhere. Roxburgh says, "It is only found during the cold season as a weed in gardens about Calcutta, and may have been accidentally introduced from Europe." It seems to have been very frequently called by Indian botanists *Spergula pentandra*, L., but its constantly three-valved capsule and smooth flower-stalks at once distinguish it. In "*S. pentandra*, L., Hooker and Thomson's Herb. Ind. Or.," from Sikkim and Khasia, the capsules are five-valved, and the pedicels glandular-pubescent. On the other hand, the specimens from "Him. Bor. Occ. Regio trop." are certainly *L. fallax*.

"*S. pentandra*, Griffith, n. 1629, Affghanistan," by authentic specimens in the Hookerian Herbarium, is unquestionably *L. fallax*; and hence *Spergula pentandra*, L., var. *intermedia*, Boissier, Diagn. Pl. Or. nov. ser. 2, pp. 93, 94, must be the same, correcting his reference to "Bourgeau, exs. 1845, n. 410," into either 1849, n. 410, or into 1845, n. 334.

As Mr. Bentham has kindly pointed out, *Medicago calcar*, Journ. of Bot. viii. 291, is probably identical with *M. Helix*, Willd.

On PROFESSOR NEES VON ESENBECK'S *Genera of* ACANTHACEÆ, *in the eleventh volume of De Candolle's* 'Prodromus;' *by* GEORGE BENTHAM, ESQ.

On the occasion of naming the *Acanthaceæ* in the herbarium of the late Dr. Lemann for the University of Cambridge, at the same time that Dr. Hooker was arranging his Indian collections of that order, I have had an opportunity of comparing the specimens named by Professor Nees von Esenbeck in two extensive sets. At the time he was preparing them for the eleventh volume of the 'Prodromus,' he had, amongst many others, the whole of the *Acanthaceæ* from Sir William Hooker's herbarium, and from my own, and, after completing the work, he returned them with his names attached, and in numberless instances these were the original specimens described. We have therefore had the inestimable advantage of two large sets of authentic specimens as points of comparison.

Like other *Monopetalæ irregulares*, the *Acanthaceæ* present considerable difficulties in working from dried specimens. The corollas are generally of a delicate texture, and not easily softened without injury, their precise forms are difficult to ascertain, and they are often so few on a specimen that the observations made upon one can seldom be verified upon others. Professor Nees has met these difficulties by great care and patience, and his descriptions are conscientiously exact, and directed to such tangible points as the specimens afforded.

There are indeed numerous cases where allied species, which he considered as sufficiently distinct in the specimens he examined, have proved wholly untenable when attempted to be marked out among the far greater mass now in the Kew Herbaria; but in this respect Professor Nees has not gone near so far as some other modern systematists, and moreover that is a question upon which there is, and always will be, considerable difference of opinion. What is really to be regretted is the excessive multiplication of genera upon characters which all botanists who have worked after him have failed to appreciate, and of which it would appear he could not himself have had any very clear conception.

There is no doubt that the limits of the old genera *Ruellia*, *Justicia*, *Barleria*, *Dicliptera*, etc., were vague and ill-defined, and that they each included a vast heterogeneous mass which required grouping and separating upon a large scale; and, in as far as separating is concerned, Professor Nees has been most laborious in the search for available characters. But that was not all that was required. In a mass of near 1500 species (reducible probably on a careful revision to below 1200), it was not enough to establish about 150 mostly small technical genera; it was necessary to form a more limited number of large natural groups. as well defined as circumstances admitted of, call them genera, tribes, or subtribes, and in this he appears to have failed. His work was analytical, not synthetical, and this was perhaps a necessary consequence of the way in which he proceeded. He did not go through the whole at once; he began with the East Indian ones, established numerous genera without reference to American forms, then took up African and afterwards American *Acanthaceæ*, and, when he came to work the whole together for the 'Prodromus,' appears to have been far too much committed to these special isolations to condense them upon new principles into any more general and natural groups. This is an operation we

have still to expect from some botanist who, with Professor Nees's inexhaustible patience and scrupulous exactness in the examination of so difficult a tribe, may be possessed of a more methodical mind, and a greater aptitude for seizing at a glance and generalizing the distinctive marks of the larger groups, always more or less indicated by nature.

As evidence in support of the presumption that Professor Nees himself did not clearly comprehend his own genera, I would instance the following species, which have been twice described by him in different genera, as shown by authentic specimens in the two above-mentioned herbaria. I do not include some cases where there are slight differences which he might have considered as generic, although we might not regard them even as specific; but the great majority of the subjoined are identical specimens, that is, specimens from the same station and collector communicated as identical, and in all cases each specimen answers to Nees's description in both places which he has assigned to them. I have not either included specimens inadvertently misnamed by him, as that may frequently occur by accident in naming large masses of plants, but have confined myself to authentic original specimens described; and were we to pursue this comparison with the original specimens in the East Indian and other herbaria he had before him at the time, there is little doubt but that the list might be considerably extended. My object is to plead some excuse for those who, like myself, in naming *Acanthaceæ*, have been so often unable to fix upon the Neesian genus to which they should be referred, and to show the necessity of a general revision and consolidation throughout the Order.

Hygrophila Schottiana, N. ab E. in Prod. p. 87 = *Calophanes crinitus*, N. ab E. *ib.* p. 107.

Stenosiphonium diandrum, N. ab E. p. 105 = *Endopogon consanguineus*, N. ab E. p. 104.

Triænanthus Griffithianus, N. ab E. p. 169 = *Strobilanthes flaccidifolius*, N. ab E. p. 194.

Goldfussia Zenkeriana, N. ab E. p. 172 = *Strobilanthes ciliatus*, N. ab E. p. 183.

Mackenziea sessilis,* N. ab E. p. 308 = *Strobilanthes cerinthoides*, N. ab E. p. 734.

Monothecium glandulosum, N. ab E. p. 310 = *Rostellularia glandulosa*, N. ab E. p. 373.

Heinzelia ovalis, N. ab E. p. 314 = *Chætothylax umbrosus*, N. ab E. p. 313.

* The ticket attached to the only specimen described by Nees was inscribed "Ceylon, J. S. Mackenzie," but in a handwriting which apparently he could not well make out.

Rhytiglossa radicosa, N. ab E. p. 344 = *Rostellularia sarmentosa*, N. ab E. p. 370.*

Rhytiglossa Havanensis, N. ab E. p. 344 }
Rhytiglossa acuminata, N. ab E. p. 354 } = { *Leptostachya Martiana*, N. ab E. p. 381, a species scarcely distinct from the common *L. comata*.†

Sericographis squarrosa, N. ab E. p. 364 = *Beloperone Amherstiæ*, N. ab E. p. 419.
Leptostachya Zeylanica, N. ab E. p. 379 = *Adhatoda Hookeriana*, N. ab E. p. 403.
Adhatoda dipteracantha, N. ab E. p. 396 = *Monechma pilosella*, N. ab E. p. 412.
Dicliptera clinopodia, N. ab E. p. 483 = *Hypoestes clinopodia*, N. ab E. p. 508.

There is moreover the greatest confusion among the specimens marked by him *Strobilanthes scabra* and *Ruellia aspera*, which are surely all congeners.

So also the names of *Phlogacanthus asperulus*, *guttatus*, and *thyrsiflorus*, *Thyrsacanthus Indicus*, and *Loxanthus Gomezii*, are repeatedly interchanged and intermixed. There appear to be amongst them three distinct species, but all evidently congeners.

The two species of *Leucorhaphis* have already been shown by Sir W. Hooker to be identical with *Belanthera*.

Numerous other notes that Dr. Hooker and myself have taken in the course of our examinations relate chiefly to the identity or confusion of species; the above are selected as the most striking that occurred to us relating to the demarcation of genera.

On Udora occidentalis, *Koch* (*Hydrilla verticillata*, Caspary), *and* Serpicula occidentalis, *Pursh* (*Anacharis Alsinastrum*, Bab.); *by* Dr. Robert Caspary, of Bonn.

(*Translated from the 'Botanische Zeitung' of December* 19, 1856.)

The other day I received from Professor Al. Braun a specimen of one of the rarest German plants, *Udora occidentalis*, Koch, from a new habitat, namely from the little Selmentsee, near Lyck, where it grew in two feet of water, in company with *Chara ceratophylla* and *C. jubata*.

* These are, of course, not identical specimens, being from different countries, but there appears no doubt as to their specific identity.

† Professor Nees enumerates seventeen species under *Leptostachya*, "Genus magis inflorescentia et habitu quam characteribus strictis definitum." Two of these are subsequently referred by himself to *Rhaphidospora*, one is repeated under *Adhatoda*, four have the habit and inflorescence of *Rhytiglossa pectoralis*, and the commonest of these four is twice repeated in *Rhytiglossa*, five more which I have seen appear to me to have in these respects no common resemblance to *L. comata* or *Martiana*, which they have not with many other Justicioid genera; the remaining five are unknown to me.

I have been long engaged in studying the *Anacharideæ*, for the purpose of ascertaining the distribution of the plant of the Dammschen Sea, and have found that Koch knew all about it; it is essentially different from the American *Serpicula occidentalis*, which was collected by Moser near Bethlehem, in Pennsylvania, and of which I have examined and identified specimens in the Herbaria of Vienna, Leipsic, J. Gay, and Sir W. Hooker. The diagnoses of the species are as follows:—

Serpicula occidentalis, Pursh.	*Udora occidentalis*, Koch.
1. Serratures of the leaves of only one cell.	1. Teeth (not serratures) of the leaves with several (three to eight) cells.
2. Stipulæ intrafoliaceæ very minute (hitherto overlooked in both species), ovate or almost quite orbicular.	2. Stipulæ intrafoliaceæ oblong or oblong-lanceolate, and wrinkled on the margin with long, linear papillæ.
3. At the base of the branches are two equal, triangular, ovate, opposite leaves.	3. At the base of the branches is a solitary, amplexicaul leaf, with its back to the axis.

The whorls of leaves of the middle of the American plant are further only three-fold, or rarely four-fold, whilst in the Pomeranian plant they are four- to seven-fold, seldom three- or eight-fold: this last difference Reichenbach has well pointed out.

I find further that the *Hydora Lithuanica*, Andrz. (Besser in Flora, 1832, No. 1, p. 12), from the neighbourhood of Wilna, in Lithuania, agrees with the plant of the Dammschen Sea in the above points and in others of less importance, and that the Stettin plant has no affinity with the American plant, but is identical with the *Serpicula verticillata*, of which I saw the original specimen in the Linnean Herbarium in London, and which is found in the East Indies, Ceylon, Java, China, Australia, and the Mauritius, but under several different forms.

Claude Richard has properly separated the *Serpicula verticillata* from that genus (whose first described species is a native of South Africa, and belongs to *Halorageæ*), and has called it *Hydrilla ovalifolia*, placing it amongst *Hydrocharideæ*. The name *ovalifolia* was however derived from a rather uncommon form, with short leaves, and was hence inappropriate to the whole species; and the specific name of *verticillata* having been indiscriminately applied by Linn. fil., Sprengel, Mühlenberg, Hooker, and others, to all the species, induced me to reject it also, following a common practice, and to give that of *Hydrilla dentata* (from the characteristic toothing of the leaves). But there is another

consideration: the rules of priority are thereby broken, and as there is no *Hydrilla verticillata*, and no confusion can arise from using it, I shall now propose that name for the *Serpicula verticillata*, L. fil.

The Dammschen Sea, Wilna, and Lyck specimens of *H. verticillata* include two forms; one of these has long, almost linear-lanceolate, slightly recurved, membranous leaves, plane at the margins, and with long (often very long) internodes; it is commoner in the Dammschen Sea, and rare near Wilna, growing in deep water; this I call var. *gracilis*, rejecting the earlier name, *Pomeranica*, because it is only geographical, and the same variety is also found in India. The other form has somewhat lanceolate, attenuate, recurved leaves, more or less crumpled at the margins, and of a thicker texture, having also much shorter internodes, which are hardly so long as the leaf; this form is found near Wilna, and also in India and China; I shall call this var. *crispa*, and withdraw the earlier name of *Lithuanica*, as being too geographical; it grows in shallow water. The plant found by Herr Sanio, near Lyck, is var. *crispa*, although more membranous than even the Wilna plants usually are.

I had early in this year suggested to Herr Sanio that *Hydrilla verticillata* might occur in the lakes of Eastern Prussia, the plant having a decidedly eastern range, and I am rejoiced that my surmise has proved correct.

Bonn, December 1, 1856.

These valuable observations settle the question of the assumed native origin of the *Anacharis Alsinastrum* in England, that plant being undoubtedly Pursh's *Serpicula occidentalis*, a species not found in Europe or anywhere in the Old World, though abounding in both temperate and tropical America.

With regard to the synonymy of the Old World *Hydrilla*, we should have been content, in a case of so much perplexity and confusion, to have followed Dr. Caspary in adopting his new specific name of *dentata*, though, as he has now withdrawn that in favour of the older one of *verticillata*, we are bound to adopt the latter. In deference also to the great service he has rendered in clearing up these obscure plants, botanists will no doubt further adopt his names of *crispa* and *gracilis* for the two varieties, though we do not think that those of *Pomeranica* and *Lithuanica* were at all objectionable. Specific names do not necessarily refer to characters in the plants themselves to which they are applied;

they may commemorate individuals or circumstances connected with their discovery, as the place where they were originally found, and as such are not only unobjectionable, but highly instructive. Precisely the same objection might be made by another purist to *crispa*, as Dr. Caspary makes to *Lithuanica*, for the plant is not crisped, and only the margins of its leaves are so. Dr. Caspary is an accomplished botanist, who, by his observations on the germination of *Orobanche*, on the structure of the flowers of *Cruciferæ*, and on various other botanical subjects, has already earned a high reputation; he is about to publish a revision of the *Anacharideæ*, and a monograph of *Nymphæaceæ*, of the great value of which works we are well assured; and we have no doubt he will find (like many of his predecessors) that as his botanical horizon enlarges, his inclination to change specific names will diminish.

Revision of the Genus TANÆCIUM; *by* BERTHOLD SEEMANN, Ph. D., F.L.S.

In the sixth volume of this Journal I submitted a revision of those genera of *Crescentiaceæ* characterized by a deciduous, irregular (spathaceous or bipartite) calyx, and now I beg to offer a revision of those having a persistent, regular one, the section *Tanæcieæ*. I commence with the type of the section, the genus *Tanæcium*. Amongst the various species that have from time to time been referred to this genus, three must be excluded, viz.:—1. *T.? paniculatum*, Sieb., which is doubtless a *Bignoniacea* proper, most likely a species of *Arrabidæa;* 2. *T. pinnatum*, Willd., which is identical with *Kigelia pinnata*, De Cand.; and 3. *T. tripinna*, Ræusch, a synonym of *Colea tripinnata*, Seem. (*Tripinnaria Cochinchinensis*, Lour.), whilst two new ones (*T. crucigerum*, Seem., and *T. lilacinum*, Seem.) have to be added. The genus will then be found to consist of *four* well-defined species, all belonging to the tropical parts of America, where they inhabit the woods and trail about the trees. They arrange themselves into two very natural groups, the one having non-rooting branches, compound, coriaceous leaves, and white, pubescent corollas; the other, rooting branches, simple, coriaceous leaves, and glabrous corollas, of a scarlet, pink, or more or less bluish tint. The former is represented by *T. crucigerum* and *albiflorum*, the latter by *T. parasiticum* and *lilacinum*.

T. crucigerum is the old *Bignonia crucigera* of Linnæus, well figured in Burrmann's edition of Plumier's work; *T. albiflorum* is the *T. Jaroba* of Swartz, the alteration of the names having become necessary, as the "*Jaroba*" of Marcgrav, from which the old specific name was borrowed, is not, as Swartz supposed, a synonym of this plant, but, judging from the indifferent description and the rude woodcut, a *Cucurbitacea;** *T. parasiticum* is a very characteristic species, the only one hitherto introduced into our gardens, which has fortunately no conflicting synonymy; *T. lilacinum* was originally founded by me upon Miquel's *Schlegelia lilacina;* latterly I have had reason to add to it *S. elongata* of the same author, and the doubtful *Besleria? violacea* and *B.? cærulea* of Aublet. There are some discrepancies in the statements respecting the colour of the corolla. In the specimens I saw in Darien it was lilac; some people might call it pink. But Aublet had a specimen with blue corollas, and others with violet ones. I am not disposed to attach any specific importance to these differences, and shall look upon them merely as varieties.

TANÆCIUM, *Swartz.*

Calyx persistens, globoso-cylindraceus, obsolete 5-dentatus. *Corolla* tubulosa, infundibuliformis, limbo 5-fido subæquali, lobis tubo brevioribus, 2 superioribus erectis approximatis paulum minoribus, inferioribus patentibus. *Stamina* 4, didynama, cum rudimento quinti; *antheræ* 2-loculares, loculis divergentibus. *Discus* glandulosus ovarii basin cingens. *Stylus* elongatus; *stigma* bilamellatum. *Ovarium* 1-loculare, multiovulatum, *placentis* parietalibus. *Bacca* oblonga vel globosa, cortice fragili corticosa, 1- vel spurie 2-locularis; *semina* plurima, compressa seu angulata, in pulpa nidulantia; *albumen* nullum.—Frutices *Americæ tropicæ scandentes, sæpe radicantes;* foliis *oppositis petiolatis simplicibus integerrimis, trifoliolatis vel geminatis cum cirrho intermedio;* foliolis *petiolulatis integerrimis;* floribus *racemosis axillaribus vel terminalibus bracteatis bracteolatisque, corollis*

* The description runs as follows:—Jaroba Brasiliensibus dicta, Casaca amargosa Lusitanis.—Altissimas arbores hæc planta ascendit, caule lento, tereti, qui hinc inde in longis pediculis tria folia opposita habet Phaseoli modo, sunt autem plane similia foliis Mucuna. Fructus autem similis fructus Cuete, sed ut plurimum minor, eadem pulpa, iisdem seminibus, ejusdem quoque usus.—Marcgr. Historiæ Reg. Nat. Brasil. lib. i. p. 25.—The figure represents a climbing stem, with alternate, tripartite or trifoliolated leaves, and obovate, dotted fruits.

albis coccineis, roseis violaceis vel lilacinis; baccis *ferrugineis vel nigris.*

The genus *Tanæcium* is closely allied to *Phyllarthron* and *Colea,* but differs from both principally in its climbing habit and the shape of its corolla.

§ I. *Caules ramique eradicantes, folia trifoliolata vel conjugato-bifoliolata cum cirrho intermedio, foliola ecoriacea. Corolla pubescens, alba.*

1. Tanæcium *crucigerum,* Seem.; ramis punctatis, foliis trifoliolatis vel conjugato-bifoliolatis cum cirrho intermedio (abortu unifoliolatis), foliolis ovatis acuminatis, supra glabris, subtus pubescente-velutinis, racemis axillaribus terminalibusque simplicibus 5–8-floris, bracteis ovato-lanceolatis, bracteolis subulatis, corolla longe tubulosa pubescente, bacca oblonga.*—T. crucigerum, *Seem. in Bonplandia,* iv. 127. Bignonia crucigera, *Linn. Spec.* 869 (*excl. syn. omnib. except. Plum.*)! *De Cand. Prodr.* ix. 152. Bignonia foliis conjugatis cirrhosis ternatis, *Plum. ed. Burm.* fasc. iii. p. 48. t. 58 (*excl. syn. omnib. except. Linn.*)!

This climber seems to be confined to the Carib Islands. I have seen specimens in Hooker's Herbarium from Dominica (*Imray!*) and St. Vincent (*Guilding!*).

2. Tanæcium *albiflorum,* De Cand.; ramis epunctatis, foliis trifoliolatis vel conjugato-bifoliolatis cum cirrho intermedio, foliolis ovato-oblongis acuminatis utrinque glabris, bracteis . . . , bracteolis subulatis, corolla longissime tubulosa pubescente, bacca oblonga maxima glabra. —T. albiflorum, *De Cand. Prodr.* ix. 245. T. Jaroba, *Swartz, Fl. Ind. Occ.* ii. 1050. *t.* 20. *f.* 1 (*excl. syn. Marcg. et ideo nomine!*). Cucurbitifera, *Sloane, Hist.* ii. 173! *Browne, Jamaic. p.* 266, *n.* 6.

Found in Jamaica (*Robins! Distan! Wright! Swartz!*); British Guiana (*R. Schomburgk, n.* 829!), and in woods near Crato, Prov. Ceara, Brazil (*Gardner, n.* 1765!).

§ 2. *Caules ramique radicantes, folia simplicia coriacea. Corolla glabra, lilacina, violacea cærulescens rosea vel coccinea* (Schlegelia, *Miq.!*).

3. Tanæcium *parasiticum,* Swartz; foliis ovatis oblongis acuminatis utrinque glabris, racemis axillaribus simplicibus 2–12-floris, corolla

* Fructus optime repræsentat capsulam vulgi, quam tabaca replent, secumque portant, uti notatur in Hort. Cliff. Plum. ed Burm. fasc. iii. p. 48.

(coccinea) glabra, bacca globosa glabra (ferruginea), seminibus angulato-oblongis parvis.—T. parasiticum, *Sw. Fl. Ind. Occ.* ii. 1053. *t.* 20. *f.* 2. *De Cand. Prodr.* ix. 245! Crescentia, *Browne, Jamaic. p.* 266. *n.* 5!

Common in the woods of Jamaica (*Swartz! Purdie! Alexander!*); near San Gabriel da Cachoeira, Rio Negro, Brazil (*Spruce, n.* 2243!).

4. Tanæcium *lilacinum*, Seem.; foliis ovatis ovato-ellipticis vel lanceolato-oblongis utrinque glabris, racemis paniculatis, bracteis ovato-oblongis acuminatis, bracteolis lineari-lanceolatis linearibusque puberulis, corolla glabra (lilacina, rosea, vel violacea), bacca ovali (nigra). —T. lilacinum, *Seem. Bot. Herald, p.* 182. Schlegelia lilacina, *Miq. in Bot. Zeit.* ii. (1844), 788. *Stirp. Surinam. p.* 116. *cum icon. De Cand. Prodr.* ix. 564! S. elongata, *Miq. in Linn.* xxii. 73. *Stirp. Surin. p.* 118. Besleria? violacea, *Aubl. Guian.* ii. 630. *t.* 254! B.? cærulea, *Aubl. l. c. p.* 631!

Ranges over Darien (*Seemann!*), Surinam (*Focke, Kegel! sec. Miquel*), and French Guiana (*sec. Aublet*).

Species exclusæ:

T.? paniculatum, Sieb. = *Bignoniacea.*
T. pinnatum, Willd. = *Kigelia pinnata*, De Cand.
T. tripinna, Raeush. = *Colea tripinnata*, Seem.

BOTANICAL INFORMATION.

Botteri's Mexican Plants.

M. Botteri is well known to botanists—firstly, by his excellently prepared plants of Dalmatia, and since, by a very considerable collection of Mexican plants, the property of the Horticultural Society of London, which were lately sold at the sale of the Herbarium of that Society, and for which there was much competition,—partly due to the perfect state of the specimens, and partly from the difficulty of procuring Mexican plants at all. Several sets of similarly prepared species, numbered and named by Dr. Seemann, varying in amount of species in each set from 300 to 400 of flowering plants and Ferns, are placed in the hands of Mr. Samuel Stevens, 24, Bloomsbury Street (W. C.),

London. Mr. Stevens will be glad to receive the names of any persons who are disposed to become subscribers, and who, besides enriching their own herbaria, would be a means of encouraging a very deserving person, who without such assistance cannot be expected to continue his researches in a very expensive country, of which the vegetation is very little known either in the garden or in the *horti sicci* of the country. The price for the dried plants is 40*s*. the 100 species, free of any other charge.

ABIES NOBILIS, *bearing Cones in the North of Scotland.*

A. W. M'Tier, Esq., has been so good as to send us recently some fine *Cones* of this noble Pine of Oregon Territory, produced on a tree of only sixteen years, planted at Durris House, near Aberdeen. Though well formed, and of a good size, very few have ripened seeds, yet there was no lack of male flowers. The tree has already attained a height of twenty-two feet, having in one season made a growth in the leader of three feet three inches; and, notwithstanding this is the first year of its bearing, the number of cones counted is upwards of forty. In the same locality, a few miles up Deeside, we believe, and not very near the sea, *Abies Douglasii,* sixteen years planted, is forty-two feet high, and has borne cones for the last two seasons, but these are generally barren. In one season its growth was six feet. *Araucaria imbricata* there is doubtfully hardy, and requires peculiar situations, such as are but little exposed to the sun. *Saxegothea conspicua* stood out the winters of 1853 and 1854 untouched, but seems of slow growth; and *Cryptomeria Japonica* promises well with a northern aspect.

Plants of M. Huet du Pavillon.

M. Huet du Pavillon (Rue Verdaine, n. 266, Geneva) and his brother returned in the autumn from their excursions into Sicily, Calabria, and the Abruzzos, as we announced in our Journal for last year (p. 380). Their botanical collections are now about to be distributed, and we are perfectly sure that from the rarity of many of them and the beautiful preservation of the whole they will give great satisfaction.

M. Huet du Pavillon has received from Chili twelve (and only twelve) beautiful sets of the plants of that country, all named "des environs de Talca, de Santiago, de Conception, de Chillan," and the majority of them "des hautes Andes." They are collected by Mr. Ph. Germain. A very few of these sets remaining on hand, consisting each of about 200 species, are offered at 50 francs the century.

NOTICES OF BOOKS.

ENGELMANN, GEORGE, M.D.: *Synopsis of the* CACTACEÆ *of the Territory of the United States and Adjacent Regions.* (From the Proceedings of the American Academy of Arts and Sciences, vol. iii.) 8vo. Cambridge, U.S. 1846.

Dr. Engelmann, the very zealous and able Botanist, late of St. Louis, Missouri, has done good service to the cause of Botany in the publication of this Synopsis. The *Cactaceæ* of the United States have been the objects of his study for several years past. "The only *Cactus* known to Linnæus from the countries north of Mexico was his *Cactus Opuntia* (Opuntia vulgaris). Long after him—more than forty years ago—Nuttall, the pioneer of West American Botany, discovered two *Mamillariæ* and two *Opuntiæ* on the Upper Missouri; and, again, twenty years later, in California, a new *Echinocactus*. About ten years ago we became acquainted with numerous *Cactaceæ*,—in Texas, through Mr. F. Lindheimer; in New Mexico, through Dr. A. Wislizenius; and in Northern Mexico through the same explorer and Dr. J. Gregg. Some others, and among them the giant of *Cacti* (*Cereus giganteus*), were indicated in the Gila country by the then Lieutenant W. H. Emory. Soon afterwards Mr. A. Fendler collected several new species about Santa Fé. Mr. Charles Wright, a few years later (1849), discovered in Western Texas and Southern New Mexico still other undescribed *Cacti*. But the greatest addition to our knowledge of the *Cactaceæ* of the southern part of the United States was made by the gentlemen connected with the United States and Mexican Boundary Commission, at first under Colonel Graham, and subsequently under Major Emory. Science is indebted principally to Dr. C. C. Parry, Mr. Charles Wright, Dr. J. M. Bigelow, Mr. George Thurber, and Mr. A. Schott for valuable collec-

tions of living as well as dried specimens, and for full notes taken on the spot. About the same time, Mr. A. Trécul, of France, and, after him, Dr. H. Poselger, of Prussia, traversed Southern Texas and Northern Mexico, collecting many *Cactaceæ* and increasing our knowledge of this interesting branch of botanical science."

"The Pacific Railroad Expedition since 1853 has opened fields not before explored; and Dr. Bigelow, the botanist and physician of Captain A. Whipple's expedition along the 35th parallel, availed himself of these opportunities in a most successful manner; while Dr. F. V. Hayden, almost unaided in his adventurous expedition, has extended our knowledge of the northernmost *Cactaceæ* in the regions of the Upper Missouri and Yellowstone Rivers. The last—but by no means the least—addition was made in 1854 and 1855 by Mr. Arthur Schott, during the exploration under Major Emory, of the country south of the Gila River, known as the Gadsden Purchase."

Such are the resources whence have been derived the materials of the present *brochure* of sixty pages. These came into the hands of one who has made a good use of them; but few of the discoveries had been yet given to the public,—"partly," says Dr. Engelmann, "because the material on hand was often incomplete; partly because it seemed desirable to publish the whole in an elaborate form, with the reports of the Boundary Commission and those of the Pacific Railway surveys. These reports are now in preparation, but the splendid plates which are to illustrate the Natural History of these plants cannot be furnished for some time. It is therefore deemed advisable now to publish short descriptions of the new species, and systematically to arrange them with those before known.

On this plan 99 species are given, the greater part of them entirely new. Of *Mamillaria* there are 30 species; of *Echinocactus*, 19; *Cereus*, 31; and of *Opuntia* no less than 50 species.

Among the most remarkable of these must certainly be reckoned the *Cereus giganteus* of Engelmann,—already described and well figured in Emory's Report, 1848,—a plant of the Lower Gila, and between it and Sonora. Its stems are from 30 to 50 feet high, and from 1 to 2 feet in diameter; its habit, judging from the figures in Emory, is quite that of our well-known *Cereus* (or *Pilocereus*) *senilis*. We have raised plants at Kew from seeds kindly sent to us by Dr. Engelmann. *Cereus Thurberi* has stems 10 to 15 feet high; *Cereus Schottii* (8 to 10 feet

high) is placed in the *Pilocereus* section, but having the seed of a true *Cereus*, thus reuniting the two genera.

At p. 54 the author candidly acknowledges that, owing often to imperfect materials and dried specimens, he may have increased the number of species more than he would probably have done had he perfect specimens and living plants before him: thus, for example, that the 30 *Mamillariæ* might be reduced to 22; 20 *Echinocacti*, to 15; 31 *Cerei*, to 18; and 50 *Opuntiæ*, to 31. The concluding pages of the Memoir are devoted to some remarks on the geographical distribution of the *Cactaceæ* in the territory of the United States: showing that the Atlantic region has only one single species, *Opuntia* (along the southern coast some West Indian species may be expected); the Mississippi region, 2 *Mamillariæ* and 3 *Opuntiæ;* the Texan region, 5 *Mamillariæ*, 3 *Echinocacti*, 6 *Cerei*, and 6 *Opuntiæ;* the New Mexican region, the richest of all, yields 19 *Mamillariæ*, 9 *Echinocacti*, 16 *Cerei*, and 22 *Opuntiæ;* the Gila region has 5 *Mamillariæ*, 6 *Echinocacti*, 7 *Cerei*, and 18 *Opuntiæ;* the Californian region has 1 *Mamillaria*, 1 *Echinocactus*, 1 *Cereus*, and 3 *Opuntiæ;* and, lastly, the North-Western region has, like the Atlantic, only one species, an *Opuntia*, common also to the Missouri, but quite different from the Eastern species, *O. vulgaris.*

WITTERUNG *und* WACHSTHUM, *oder* GRUNDZÜGE *der* PFLANZENKLIMATOLOGIE; *von* HERMAN HOFFMANN, Doctor der Medecin und Philosophie, ordentl. Professor der Botanik in Giessen. Leipzig, 1857.

Under the above title, which may be paraphrased (for, like so many German titles, it hardly admits of translation into English), "Climate and Growth, or the Elements of Climatology as it affects Plants," we have a laborious work by Dr. Hoffmann, Professor of Botany at Giessen. In the fifth volume of this Journal, page 408, we had occasion to allude favourably to Dr. Hoffmann's pamphlet on the areas of distribution of the Phænogamous plants of North Germany, and from the present work we may judge that his attention has since then been turned to another branch of the same great subject of the causes of distribution.

The volume now before us is a substantial octavo of nearly 600

pages, and is divided into two Books; the first devoted to specialities, the second to generalities. Under the first are—1. Meteorological observations; 2. Observations on the growth of plants, followed by the results of these, and a table of curves, founded upon the previously-detailed observations on growth and the weather. Under the second Book are —3. Considerations regarding growth; 4. Considerations regarding climate (weather); 5. Climatic conditions of plants; 6. Concluding remarks; 7. Appendix.

The meteorological observations extend over the year 1854, and were taken at Giessen; they include the daily maximum, minimum, and mean temperature of the air in the shade; the solar radiation; the temperature of the earth at one Paris foot depth, at nine A.M. and four P.M.; the temperature of a spring; sunshine every quarter of an hour; rainfall, in Paris inches; duration of rain, in quarters of hours daily; mean daily humidity; mean height of the barometer daily; moon's phases; hoar-frost; snow; fog; storms; direction of the winds; fog from marshes.

The observations upon growth are made upon the following plants:—

1. *Amygdalus Persica.* (Leaves and twigs.)
2. *Galanthus nivalis.* (Flowering and leafing.)
3. *Hordeum vulgare.* (Appearance of stem-leaves and axes of plants sown at different periods, etc. etc.)
4. *Prunus Avium.* (Buds.)
5. *Prunus domestica.* (Buds.)
6. *Pyrus Malus.* (Buds.)
7. *Quercus pedunculata.* (Buds.)
8. *Ribes Grossularia.* (Sprouting of leaves, with twigs.)
9. *Secale cereale.* (Stem-leaves and stem.)
10. *Solanum tuberosum.* (Different varieties; leafing, and formation of stem-leaves, with twigs, etc. etc.)
11. *Syringa vulgaris.* (Leaves and flowering, etc. etc.)
12. *Triticum vulgare.* (Leaves and stem.)
13. *Vitis vinifera.* (Sprouting of the plant, leaves, flower-branches, etc. etc.)

Then follow tables containing exact measurements of the growth of the various parts of the above-mentioned plants, occupying upwards of 100 pages, disposed in columns.

Dr. Hoffmann then proceeds to determine the absolute value of meteorological conditions upon the growth of plants, in the following manner: taking the leafing of *Amygdalus Persica* as an example, its leaves grew rapidly at first, and reached a maximum rate of growth (six lines) on the 21st of April, increasing as the power and warmth of the sun increased, and the consequently warmer days and nights. On the 22nd, the rate of growth had decreased rapidly, in consequence of the weakened power of the sun's rays on this and the preceding days, in spite of the higher maximum and milder nights. From thence to the 24th, contemporaneously with the rapid sinking of the temperature of the earth, accompanied with frosty nights, the growth further decreased, in spite of the long sunshine. After rain, with the cooler mean temperature and lower maximum, the growth diminished, and ceased altogether on the 30th of April.

The value of such observations as these does not depend upon the nicety with which the growing organs are measured to minute fractions of inches, but upon the number of observations from which the mean results are reduced; and it is satisfactory to find that Dr. Hoffmann has not confined his observations to single specimens and species, nor to plants sown at one season of the year only. On the other hand, it appears to us that equally useful results might have been attained at infinitely less expenditure of time and labour, and it is not without wonder that we find no allusion throughout the whole book to M. De Candolle's 'Géographie Botanique Raisonnée.' The latter work, whether for the number and value of the results of similar observations that it offers, or for its analyses of the methods of obtaining such results, appears to us of essential use in all such investigations, whilst to ignore its existence and that of M. De Candolle's previous researches, is simply incomprehensible.

The considerations to which the remainder of the work is devoted do not strike us as either original or suggestive, with the exception of some observations and experiments upon the process of freezing in leaves; but the whole is enveloped in a cloud of verbiage that renders any attempt to sift what may be new or important from the rest, a far from promising operation. A summary of the author's results would have been a boon, or rather might fairly be demanded by the reader, who must else wade through nearly six hundred pages of very unattractive matter in the attempt to obtain it for himself.

In conclusion, with every respect for Dr. Hoffmann's industry and perseverance, we cannot avoid coming to the conclusion that we should have preferred finding the results of his labours in a communication to the 'Monatsbericht' of the Berlin Academy, for neither their interest nor importance demanded their publication *in extenso.*

Ueber einige FARNGATTUNGEN (*On some Genera of* FERNS). I. POLYPODIUM. *By* G. METTENIUS. (Extracted from the second volume of the Transactions of the Senkenbergian Society of Natural History). Frankfort-on-the-Main, 1856.

Dr. Mettenius thinks that in order to test the soundness of the views which have led modern pteridologists either to subdivide or to preserve the limits of the old genera of Ferns, *Polypodium* offers the best and most ready means; and he consequently commences his Paper with an enumeration of the species of that genus, prefaced by a critical review of the various organs upon which the generic distinctions of *Polypodieæ* have been founded. He does not give in this place, we regret to say, the characters which he considers typical of his *Polypodium,* but refers us for them to his work entitled 'Die Farne des Botanischen Gartens zu Leipzig' ('The Ferns of the Botanic Garden at Leipzig'), published in 1856, so that we have to study his views contained in the first seventeen quarto pages of the present work, before we gain any knowledge on that point. The drift of his argument seems to be this, viz. that the importance of various organs as generic characters has been very much overrated, and that in consequence, too many genera have been made. These he labours to abolish by pointing out numerous transitions from one state or form of an organ to another. However it must be confessed that in many places he argues against himself, by adopting in the synoptical part of his Paper, the very characters for subdivisions which he shows to be invalid for the circumscription of genera. Thus, for instance, when speaking of the value of the free and anastomosing veins, he says, "The facts quoted sufficiently prove the correctness of my views, that neither between the species with a different development of the free veins, nor between the species with free and anastomosing veins, can there be drawn any natural boundaries" (p. 3). Yet, on turning to pp. 17 and

22, we find that the "nervi liberi" and the "nervi anastomosantes" are the primary points upon which his division of the genus *Polypodium* is made to rest. This is a kind of reasoning we do not understand, for if these characters were so artificial as to be unfit for generic purposes, why apply them for subgeneric? If they broke down in the one place, surely they will break down in the other.*

Having shown the insufficiency of the characters derived from the free and anastomosing veins, he considers the articulation of the petiole, to which however he is not inclined, in the present state of our knowledge, to attach any generic importance. He does not seem to be aware that the latter character is always accompanied by others,† as has been pointed out by Newman and J. Smith. The division of the frond, the articulation or non-articulation of the pinnules, and the difformity of the fertile and sterile fronds, are also rejected as generic characters. The epidermidal organs, and the sporangium in all its bearings, are then fully discussed, and a great many facts invalidating various generic characters derived from them, are brought forward.

Of the enumeration of the species, the specimens preserved in Kunze's Herbarium form the chief basis, and diagnoses are given of them. Of the species described by Dr. Mettenius in other publications, we have only the names, and the same is the case with those known to him merely from figures or descriptions. The *latter* are inserted in a manner which requires a little explanation. Thus, for instance, his No. 100 is *Polypodium incanum*, Sw., with four varieties (α, β, γ, δ); then follows "(100 *b*) *P. microlepis*, Fée;" "(100 *c*) *P. remotum*, Desv.;" and "(100 *d*) *P. lanosum*, Fée." Many would take these to be anything but what the author means them to be, viz. allied species (though assuredly, to our own knowledge, many of them very distinct) of which he has merely seen a figure or description. It may also be remarked that the "enumeration" does not include all the species published during the last two or three years. *Polypodium*, as here given,

* It will readily be seen that our friend who obligingly communicated this notice is favourable to the great multiplication of genera of the present day; but we do not at all agree with him that because certain characters are not of sufficient importance to constitute genera, they are equally inefficient for sectional characters or subgenera. The same kind of argument would equally apply to species, and consequently every species would become a genus.—Ed.

† Is it really so?—Ed.

professes to be the Linnæan *Polypodium*, but combining *Grammitis*, Sw., (*ex parte*), but rejecting the extensive *Phegopteris* group.*

De Vriese, Guil. Henr.; Plantæ Batavæ Orientalis, *quas, in itinere, per insulas Archipelagi Indici Javam, Amboinam, Celebem, Ternatam, aliasque, annis* 1815–1821 *exploravit* Casp. Georg. Carol. Reinwardt, etc. etc. Jussu Augustissimi Regis Guilielmi III. Fasc. I. Lugd. Bat., 1856. Large 4to.

Scarcely two months have elapsed (*vide* our January number of this Journal, p. 28) since we gave a notice of the intended publication of this work, and that notice was accompanied by a brief but interesting biographical memoir of the life of Professor Reinwardt, by the editor of the present work, Dr. de Vriese.

In the present fasciculus, after the dedication of the grateful pupil (De Vriese) to the memory of his excellent preceptor (Reinwardt), and a short introduction, the genera and species of the Cyrtandraceous group of *Gesneraceæ* are described. *Dichrotrichum* is a new genus of Rwdt. MSS., destined to receive the *Tromsdorffia elongata*, Bl.? Bijdr., and of R. Br. in Horsf. Pl. Jav., under the name of *D. Ternateum;* and of this a noble figure (large folio) is given (Tab. I.). *Cyrtandra longirostris*, De Vr.; *C. longipetala*, De Vr.; *C. umbellata*, De Vr.; *C. spicata*, De Vr.; *C. decurrems*, De Vr.; *C. repens*, De Vr.; *C. Sandei*, De Vr.; *C. heterophylla*, *C. rubra*, *C. mollis*, and *C. cordifolia* are new species of De Vriese of this genus, and of twenty-one here described which were placed under *Rhynchocarpus* in Reinw. MSS.

The *Hepaticæ* follow next, and are described by Dr. C. M. Van der Sande Lacoste, most, if not all, of which have been previously published.

* The Editor regrets the impossibility of his doing justice to the views of the learned author of this publication, owing to the introductory matter being all written in German, and unfortunately the same is the case with the work to which allusion is above made, 'Filices Horti Botanici Lipsiensis.' His views and all the explanations of his terms, etc., are given in nearly twelve very closely printed folio pages in the German language. In the body of the work, most of the sectional names have no sort of explanation. We cannot doubt that the author, however much we may differ from him in what we do understand, must have thrown much new and valuable light on the structure of Ferns, and both the works mentioned in this note are accompanied by a great number of figures and much accurate analysis. —Ed.

Ternstrœmiaceæ are next considered. *Eurya Celebica*, Rwdt. MSS., is a new species; *Gordonia Wallichii*, De Cand., is transferred to *Schima*, as is the *S. Wallichii* of Korthals.

Saurajeæ are considered as a distinct family from *Ternstrœmiaceæ*. No less than ninety-seven species are characterized; but these include the discoveries of others besides Reinwardt.

Sapotaceæ.—This family is of peculiar interest, as including the now celebrated though only recently discovered *Gutta Percha* ("rectius verò *Getah-Pertja*"), and our excellent friend gives a valuable catalogue of the *Sapotaceæ*, (with characters and remarks,) of the genera and species of the Malay Archipelago, known to yield substances analagous to Gutta Percha; and he strongly urges inquiry to be made as to the relative value of the respective products. The species are as follows:—1. *Chrysophyllum lanceolatum*, De Cand. 2. *C. rhodoneurum*, Hasskl. 3. *Sideroxylon nitidum*, Bl. 4. *S. attenuatum*, De Cand. 5. *S.? chrysophyllum*, De Vr. 6. *Isonandra Gutta*, Hook. 7. *I. Gutta*, Hook.; var. *oblongifolia*, De Vr. "Differt a specie Hookeriana his notis: foliis oblongis (nec obovato-oblongis) longissime acuminatis. Hab. Insulam Borneo." We have received the same plant ourselves from Borneo, and with the same points of distinction from the Singapore plant, but unfortunately without flowers. 8. *I. puberula*, Miq. 9. *I. dasyphylla*, Miq. 10. *Ceratephorus Wightii*, Hasskl. (Isonandra polyandra, *Wight*). 11. *C. Leerii*, Hasskl. 12. *Cacosmanthus*, Hasskl. (nov. Gen. et Sp.) 13. *Bassia cuneata*, Bl. 14. *B. sericea*, Bl. 15. *B. argentea*, De Vr. 16. *B. Junghuhniana*, De Vr. 17. *Mimusops Manilkara*, G. Don. 18. *M. acuminata*, Bl.

Myrtaceæ.—Under *Melaleuca Cajeputi*, the question is considered whether the green colour of the oil is natural to it, or due to the copper vessel in which it has been distilled; and this seems to be set at rest by the experiment of Reinwardt, who distilled the leaves in water in a copper vessel lined with tin, when an oil was obtained, "ferè limpidum, subflavescens, sed non viride." Interesting information is given respecting the Clove (*Caryophyllus aromatica*, Linn.), and allusion is made to the many errors of authors regarding its history, especially of Mr. Crawford in his work on the Indian Archipelago, a subject that will be more fully treated on in the 'Travels of Reinwardt,' about to appear. *Barringtonia* is represented by four species. The fasciculus closes with *Dilleniaceæ*, but affording nothing new. The plates, three in number,

are remarkably well executed, and, besides the *Dichrotrichum*, above mentioned, consist of *Saurauja angustifolia*, Rwdt., and *Corellia Ribes*, Miq. All have excellent dissections.

DOZY, F., *et* J. H. MOLKENBOER : BRYOLOGIA JAVANICA. 4to. Fasc. VIII., IX., and X., each with five plates. Leyden, 1856.

Three fasciculi of this important work have appeared during the past year, conducted by Mr. F. Dozy alone, since the death of his *collaborateur*, Dr. Molkenboer, and the fifteen plates, with the very full descriptions, include the following species :—*Pogonatum Neesii*, C. Müll., *Calymperes Moluccense*, Schw., *C. Motleii*, Mitten, *C. Hampei*, Dz. et Mb., *C. serratum*, A. Br., *C. fasciculatum*, Dz. et Mb., *C. Mülleri*, Dz. et Mb., *Syrrhopodon Gardneri*, Schw., *S. tristichus*, Nees, *S. Laboeanus*, Dz. et Mb., *S. Jungqulian* (sic in tab. et in descr.), Mitten, *S. Sullivanti*, Dz. et Mb., *S. ciliatus*, Schw., *S. tenellus*, Dz. et Mb., and *Pottia julacea*, Dz. et Mb. : this is the fiftieth and last plate.

It is but little more than twelve months since we had to record the death of Dr. Molkenboer in this journal, at our last notice indeed of his work ; and now, together with the three fasciculi of the *Bryologia Javanica* under consideration, we receive the unwelcome news of the death of M. Dozy, accompanied by the following tribute to his memory from the excellent Dr. and Professor De Vriese.

"M. François Dozy, botaniste distingué hollandais à Leide, vient de terminer sa carrière. Dès sa jeunesse il s'est appliqué à la botanique et à la chimie. Il a fait ses études à l'Université de Leide, où il a assisté aux cours du vénérable Reinwardt. Le zèle avec lequel il a étudié la flore du pays est vraiment rare. Il est un des fondateurs de la société pour l'étude de la flore du pays et des colonies à Leide. Son herbier était un des plus complets sous le rapport de la flore indigène. Ses travaux sur l'histoire des Mousses de l'Archipel des Indes sont généralement connus. Sa mort est une grande perte pour cette partie de la science ; surtout après le décès de M. Molkenboer, son digne collaborateur et ami intime.

"Il faisait la pratique médicale pendant le jour, et s'occupait de ses mousses le soir et pendant une grande partie de la nuit. Il paraît que sa constitution, du rese assez robuste, n'a pas pu résister à un tel excès de travail. Se trouvant mal, et cherchant le repos par un relâche de sa

pratique et de ses travaux, il s'est rendu avec son épouse pour quelques semaines en Allemagne. Il a trouvé à Neuwied un éternel repos!

"Nous déplorons un ami respectable et fidèle; son épouse et ses enfans ont perdu tout. La mort d'un epoux et d'un père est irréparable. Il n'avait encore que 49 ans.

"Sit illi terra levis!"

RETZIA, *sive* OBSERVATIONES BOTANICÆ *quas de Plantis Horti Botanici Bogoriensis annis* 1855 *et* 1856 *fecit* J. K. HASSKARL. 4to, pp. 1–40.

OBSERVATIONES BOTANICÆ *quas de* FILICIBUS *Horti Bogoriensis necnon ad montem Gedeh aliisque locis sua sponte crescentibus annis* 1855 *et* 1856 *fecit* J. K. HASSKARL. 4to, pp. 1–56.

Amidst the arduous duties of Mr. Hasskarl in Java, connected with the importation and successful cultivation of the *Cinchona*, as related at pp. 302 and 337 of our last volume, this active botanist has found time to commence two works on the plants of Java, under the above titles; the one devoted to flowering plants, the other exclusively to Ferns. We fear however that the author's health has suffered by climate and over-exertion, so that he has now returned to Europe for recovery, where it is his intention to unite all his 'Observationes' in one work (and we believe one volume), to be entitled 'Hortus Bogoriensis Descriptus,' which will contain descriptions or critical observations of about 600 species of Phænogamous and Cryptogamic plants.

Of the works which head this notice, the *Retzia* (40 pages) contains critical remarks, and often very full descriptions of Phænogamous plants cultivated in the Garden of Buitenzorg, nearly all foreign to Java, and well known species. In the other work, confined to *Ferns* (of which 56 pages have appeared), the author elaborates the *Gleicheniaceæ* of Java, the *Cyatheaceæ*, and part of the *Dicksonieæ*. Most of the information here contained, but in a more condensed form, was communicated by Mr. Hasskarl to the Editor of this Journal in 1855, and published in our seventh volume, page 321.

ERRATUM.

At page 57 of this volume, line 13 from below, *read* "gemmation" *instead of* "generation."

W. Fitch del et lith.

Vincent Brooks Imp

Prionium Palmetta, *E. Meyer.*

THE EXHIBITION AT PARIS IN 1855; FOREST ECONOMY, *particularly as regards the Austrian Department; by* MR. KREUTER, C.E. (*Read before the General Meeting of the Imperial Agricultural Society at Vienna.**)

The programme of the Second Class of the Exhibition at Paris included the Economy of the Forest, the Productions of the Forest, Hunting, Fishing, and such as are gained without cultivation, divided into eight subdivisions.

I. Statistics and maps concerning the condition of forests, general cultivation, hydrography, distribution of animals, fishes, and plants.

II. Economy of the forest, revenue of the forest, applicability of the wood for timber, fuel, or ship-building.

III. Industry and productions of the forest, potash, charcoal, manufactured wood, preservation of wood.

IV. Concerning the chase of land and amphibious animals.

V. Concerning fisheries, whale fishery, marine and fresh-water fisheries, molluscs, and zoophytes.

VI. Natural productions, viz. wild tubers, fibres, eatable fruits, oil fruits, sugar from Palms and Maple-trees, beverages, gums, resins, and pigments.

VII. Extermination of detrimental animals.

VIII. Acclimatization of useful animals and plants.

At the first glance, and with our ideas of a civilized world, much of interest could not be expected from this Class; but, after an accurate inspection of the very detailed programme, it might be conceived that, had it been answered, this Class would have been the most interesting one of the whole exhibition. Unfortunately the invitations were not sufficiently responded to to form a complete collection. It is true the English colonies and Algiers had done a great deal in order to show their abundance of natural productions, in virtue of which were exhibited a number of most interesting objects, many of them not before seen in Europe, which rendered this Class exceedingly attractive and instructive.

There were in the Jury for this Class the most celebrated scientific and practical men. Sir W. Hooker was president; Brongniart, De-

* Obligingly communicated by Mr. Kreuter, and translated by Mr. Emil Tittelbach.—ED.

caisne, Milne-Edwards, Geoffroy St. Hilaire, Vicaire, Parlatore, Theroulde, Focillon, etc. etc., were members of the Jury.*

Time does not permit, and it would be tiresome for the noble members of the Society were I to deliver a complete report of all the objects of this Class. After having made some general remarks, I shall think it necessary to confine my observations to *Austrian products.*

As respects the First Section, there were but few things exhibited, some quite ordinary maps of not extensive districts, concerning the condition and extent of forests in the northern part of France, a zoological map and specimens of woods and stones without particular interest.

The Second Section, namely, "Economy and Revenue of the Forest," is that which offers the most interest.

After the cereals (grain, corn), wood is one of the most important necessaries of life; the consumption of fuel is a measure of the industry, and therefore of the civilization, of nations. "Fuel is the greatest wealth, the foundation of the power of a nation," says a celebrated English political economist; and consequently this object is worthy of some consideration. Want of fuel in the old world is nowadays an often discussed question; in Asia and Africa there are vast deserts where once dwelt powerful nations under the shade of patriarchal trees; the south part of Europe is destitute of forests; there, where once grew the woods celebrated in song by Homer and Virgil, are at present nothing but naked rocks; in France and England the need of wood increases every year corresponding with the progress of industry and the enlargement of commerce, but the indigenous productions of France are very trifling, and in England there are scarcely any forests.

The general want of wood, and the disadvantage arising from the devastation of forests, have induced many enlightened Governments to seek means for the restoration of the needful amount of forests, which have led in some places to very satisfactory results, so that the restoration of forests is at present a very important branch of the science of forestry. It was pleasing to learn at the Exhibition at Paris, where the experienced men of all nations were assembled as judges, that there are in Germany the best foresters, that there exists the best economy of the forest, and that there is obtained from its woods the most constant revenue.

* We take leave to add also the very talented author of this Paper.—Ed.

Austria is exceedingly rich in forests. The official notices furnished to the Jury of the Exhibition state that a third of the area of the empire fit for use is covered with forests. Notwithstanding this vast proportion, in some parts people fear the want of wood, and it requires the greatest caution of the foresters to prevent the annihilation of those beautiful trees.

In particular the forests of the Rhine-provinces of Prussia, of Thuringia, of Baden, and of Bavaria, were rendered prominent by the French, English, and Spanish Government-commissioners, who travelled through Germany by order of their Governments; and Mr. Vicaire, the Inspector-general of Forests and Imperial Domains, stated with great satisfaction that near Metz already the same way of cultivation of forests had been introduced as exists in the neighbouring Prussia. In France there have been issued, within the last ten years, many enactments; large sums have been voted for the plantation of the mountains with trees, and many books written; but in reality nothing has been done; nay more, it is forgotten that such enactments even exist.

From different countries were exhibited at Paris collections of many kinds of forest wood. The crown is due to the English colonies; their collections were the richest, most beautiful, and best arranged, and contained the rarest specimens, some of them quite new.

Canada had exhibited all its productions of industry and raw productions together, all laid out with elegance and taste, and thus furnished so beautiful a collection that it deserves to be marked as the most distinguished. Canada exports every year wood to the value of fifty millions of francs, most of which is sent to England; in particular their Conifers are renowned in commerce. There were exhibited sixty-four kinds of wood, thirty-two of which were collected on an area of sixty *joch.* All were beautiful specimens; not only sections, boards, staffs, hoops, posts, as they appear in commerce, but also joiners' work.

Amongst these specimens were excellent kinds, as White Pine, Yellow Pine (*Pinus mitis*), Red Larch, Tamarac (*Larix Americana*). White and Yellow Pines and Red Larch are very much valued for timber, even for ship-building (the Yellow Pine), which at present is much in demand. The Oaks (*Quercus rubra, macrocarpa, coccinea*) do not furnish useful timber for ship-building, being liable early to the attacks of the so called red-worm; therefore it is said that ships constructed of this material are of little use after three years.

One species of American Oak, *Quercus alba*, is said to be fit for ship-building, but is so rare that the English Government has already reserved all the trees for the Royal Navy. Among the most interesting productions of the forest is also the Maple-sugar, of which is produced in Canada and the United States annually about 40,000,000 pounds. The Maple-trees made use of for this purpose are very soon destroyed in consequence of the loss of their sap; and as there is no cultivation of them in northern America, it is to be feared that the Maple-tree will soon be exterminated. Amongst the above-mentioned specimens are some beautiful kinds fit for joiners' work, as the wild Bird-Cherry, the watered Maple, the Black Walnut. In general the woods resemble those of northern Europe, without possessing the beauty of our Walnut-tree; they cannot be compared with Mahogany, or the tropical and Australian timber.

Australia, viz. the colony of New South Wales, exhibited a collection of 262 woods, 92 of which were botanically determined. *There* is a new world; plants which we are accustomed to see like feeble insignificant specimens in our greenhouses appear there with colossal trunks; for instance, *Eucalyptus, Podocarpus, Melaleuca, Doryphora,* and some Cedar-like trees. Their timber may be classed among the finest in the world, and will play an important part as regards furniture-manufacture. Many of them have not only the finest grain and the gayest colour, but moreover a natural fragrance; for example, a species of Acacia wood, exceedingly finely watered with light-yellow and dark-brown, smells like violet, "Bois de Violet." There grow trunks of Rosewood of 36 to 72 inches English in diameter, and 80 to 100 feet high. British Guiana likewise has exhibited magnificent kinds of wood; amongst it is a tree, *Mora excelsa*, that promises well for ship-building; it grows to about 100 to 150 feet in height, is straight, and furnishes a very durable timber.

There are, in the *Indian Department*, specimens of Teak, belonging to the Order of the *Verbenaceæ*, said to surpass every other timber. It grows in the East Indies and Ceylon, but will also thrive in the southern part of France. [Surely not to be expected.—Ed.]

Of great importance for ship-building is the Mahogany-tree of Honduras, the timber of which is not so heavy as Oak-wood. Ships built of it possess a fifth part more buoyancy than those of Oak. By this exhibition of timber from her different colonies, England has shown

that she can supply the need of timber for her navy out of her own possessions.

The exhibition of woods from Great Britain was very interesting, as it contained, besides the indigenous woods (Oak, Beech, Birch, and Scottish Fir), the introduced and naturalized trees, such as the Pine (no. 1683, from Germany), the Larch (1629, from the Alps), the Cedar (1683, from the East), and the Red Oak (1691, from America). At present [some of—Ed.] these trees are quite naturalized, and form the finest forests, especially in the Scottish mountains. The Deodar Cedar from the Himalaya, the Douglas Fir from the rocky mountains of northern America, and the *Wellingtonia* from California, are new introductions, and entitle us to the fairest hopes.

France had exhibited but few specimens of wood. Trunks fit for timber grow every day more rare; and all the cultivation of forests there extends no further than the production of fuel, for which purpose the plantations are periodically cut down. In Paris no log wood is to be seen, only sticks. In northern France there are yet some old forests, in Calvados fine Elms, in the departments of Dordogne and Garonne, and in the Landes, some Oak-forests, which however do not yield very large trunks, but are yet used for ship-building, and they are cut down rashly, without regard to after-growth.

The French colonies had exhibited very nice specimens of wood; but they were not arranged, and were without any details concerning the statistics of the forests. The most remarkable of the collections of the French colonies was that of Algiers, in particular as regards woods and products of the forest, and showed in this respect the abundance of this colony. France has in Algiers 1,800,000 *joch** of forests, which yield the best timber and ornamental woods. There are in these forests not only Oak and Sweet Pine-tree (*Pinie*), especially the splendid Atlas Cedar, which furnish the best wood for ship-building, but also Olive-trees, Cypresses, and different kinds of *Thuja*, which are extremely useful for the purpose of fancy furniture, and are already much employed in Paris. A table of five feet diameter was made of the cross-cut of an Atlas Cedar of 400 years of age.

Sweden and Norway had exhibited very handsome planks of Conifers from "Sapin du Nord;" besides a collection of cross-cuts of different timber, that deserves to be called splendid, as regards their regularity

* The extent of forests in Algeria is estimated at 2,272,567 acres.—Ed.

of growth and quality, viz. Oaks, Birches, Firs, Beeches; in particular I may mention an Alder (*Alnus incana*) of thirty inches in diameter, showing forty-seven concentric rings, a tree which cannot be too highly recommended for cultivation.

The Greek Government exhibited a collection of seventy-seven specimens of woods from the forests of Achaia and Elides. It was well arranged, properly named, and the most of them were accompanied by leaves and seeds. It is a pleasing testimony that the Greek Government, in spite of existing difficulties, pays attention to the material circumstances, as typical of the regeneration of Greece, which is also proved by the re-plantation of mountains, whereby the wealth of a nation is established.

Tuscany likewise does very much in forming plantations and laying out of new forests. His Royal Highness the Grand Duke has taken much interest in it, and the distinguished Inspector-general of forests, Mr. Simoni, has performed a great deal. In Casentino the Calmaldulean monks occupy themselves in rearing forest-trees; in the Maremme, Sweet Pine-tree (*Pinie*) and Cork-tree forests are going to be established.

Spain and Portugal also have exhibited collections of their forest productions, which were remarkable for many fine Oak specimens, and for planks cut from the trunks of *Pinus maritima*.

Prussia had exhibited nothing. The Grand Duchy of Baden sent a small collection of specimens of wood, as they appear in commerce; besides a very interesting description of the cultivation of wood in the Black Forest (Schwarzwald), and of its revenue. The Zollverein, viz. Bavaria, Baden, and the Rhenish provinces of Prussia, sell every year to France timber to the amount of ten millions of francs; to Sweden and Norway to the amount of twenty-four millions; to Switzerland to the amount of about eight millions.

Having stated the above, I will now speak of Austria. Five exhibitors had furnished specimens of Oak, Elms, Firs, Pines, and Larches. This may be supposed superfluous, for every one knows Oak and Fir; but these well-known specimens caused the greatest admiration, by the beauty of their growth and their good quality; and when it became known how great is the extent of forests, in particular of Oak-forests, in Austria, and to what dimensions the Oaks grow there, their interest was raised to the highest degree, and Austrian specimens of Oak-wood

were by practitioners more looked at and admired than even the yet untried specimens from the English colonies of the New World.

At present the greatest inquiry is after timber for ship-building. Englishmen, Frenchmen, Americans, expressed their admiration of Austrian Oaks; and, according to their statements, Oak-wood of such dimensions is not to be met with anywhere else, except in a small part of Russian Poland. The exhibitors were their Excellencies the Counts St. Genois and Zamoisky; the domain Brandeis, from which came a section of an Oak of sixty-four years of âge, which was thirty-six inches in diameter; this was the object of admiration of the ship-builders of all nations.

Mr. Bienert, in Maderhäuser (in the district of Budweis), a tenant of the forests of the Prince of Schwarzenberg, had sent excellent specimens of wood of unsurpassed quality, adapted for the manufacture of musical instruments, particularly sounding-boards. He exhibited two cross-cuts of Fir; the one grown on rocks showed fourteen inches of diameter, and 430 concentric rings, and from such trees in particular sounding-boards are made;—the other showed four feet of diameter, and 450 concentric rings: the tree had grown at the foot of a mountain, in ordinary soil. The cross-cuts of Oak-wood sent in by Count Zamoisky and Count St. Genois, were five to six feet in diameter, and of exceedingly regular growth: they excited general admiration.

When I saw what an important place the Austrian Oak-wood occupied at the Exhibition, I wrote for some specimens from Slavonia, in order to obtain the opinion of the English and French ship-building engineers present on the Jury. Count Elz, at Vukovar, sent five specimens: *Quercus Cerris*, *Robur*, *pedunculata*, *fœmina*, and *Austriaca* (also called *alba* or *macrocarpa*). It was considered that *Quercus Robur*, *fœmina*, and *Austriaca* were excellent for ship-building.

Everywhere the plantation of Oak is highly recommended, and the Government exerts itself to secure for the future a needful quantity of timber for ship-building. Of this Austria has yet abundance, which will form a great part of her national wealth, if it is properly converted into money, and if the forests are managed in such a manner as to have sufficient after-growth. Now the question is to find means to convert the wood into money in the most advantageous manner; and this is to be done by sending it directly to the timber-merchants in great seaport-towns. I have visited the dockyards at Toulon, Bor-

deaux, Brest, Cherbourg, and Hâvre; have ascertained the dimensions of timber requisite for ship-building, and have found that in these places a good business could be created, as the ship-builders pay high prices for the raw material.

To give an idea of the quantity of Oak timber used for this purpose, I may mention that France requires annually for the Imperial navy, 1,120,000 cubic feet, and for the commercial navy, 1,400,000 cubic feet; total, 2,520,000 cubic feet. England needs five times as much, and obtains this material from all parts of the world. The need of Oak timber is increasing every year. Europe is left behind by America in ship-building.

One example, stating what is performed in our days in ship-building, may be of interest to this Society. There was at the Exhibition the model of a ship that is building at present in England, under the direction of the famous Mr. Brunel, and is intended to sail for Australia. It is the largest ship ever borne by the ocean, a steamer of 2500-horse power, and 460,000 *centner* burden; it is 115° long and $12\frac{1}{2}$° in width; it requires 644,000 cubic feet solid timber. The commercial navy of the United States of America is greater than the English, and six times as large as the French. Ship-building in America is very flourishing, nevertheless the timber used for that purpose is not particularly good, and therefore the quality of these ships is inferior to those built of European Oak.

Besides ship-building, very much timber is consumed by the railroads. A sleeper measures three cubic feet, and one mile of single rails requires about 8000 sleepers; they last on an average five years; therefore 1600 require changing annually, that is, for 100 miles 160,000. Austria will have finished, at no distant time, 300 *meilen* of railroads, and is continually constructing more and more new railways; therefore in future an annual supply of 500,000 sleepers will be required. Supposing that there exists a seventy-years-old Oak-forest and a fifty-years-old Fir-forest, to provide trees fit for sleepers, and that there are growing 250 sleepers in the area of one *joch*, then a forest of 790,000 *joch* will be required for the supply of the above; this is equal to seventy square *meilen*. Science has assisted here too by the ingenious and simple method of Dr. Boucherie, who impregnates wood with metallic oxides, and especially with sulphate of copper, by which soft woods, as Birches, Alders, Beeches, Maple-trees, etc., which

could not be made use of underground by reason of their speedy decay, are rendered incorruptible; and thus by using these quickly-growing woods, the procuring of sleepers is facilitated. There were shown to the Jury sleepers of Beech, Alder, Birch, and Fir, which had been for nine years underground, and yet were not rotten; likewise poles for the telegraph and for vineyards.

Dr. Boucherie has received, in acknowledgment of his discovery, the Order of the Legion of Honour and the great Gold Medal.

Among the most remarkable objects in the Exhibition were the machines used for manufacturing of barrels. The contrivance is very ingenious; a series of five machines, which require 10-horse power, produce, from a block of oak, a complete barrel, which is so beautifully made, nay, finished with such mathematical accuracy, as it never could be by hand. The great advantage is this, that out of a circular block so many staves are cut, that there is but five per cent. waste, every piece being worked up; even blocks, only a foot long, being used for small barrels. The price of a barrel is hereby reduced to half the former amount. The price of as many machines as would manufacture annually 30,000 wine-casks (each to hold three *eimer*), including steam-engine, but excluding buildings, is about 18,000 florins.

To this Class (II.) of the Exhibition belongs the revenue obtained from *uncultivated* plants, and the introduction and acclimatization of new plants and animals. To the plants deserving to be introduced belong, in particular, the forest-trees, especially Conifers, from the East Indies and America, from which much may be hoped, and with which the English make the fairest experiments.

As regards the introduction of new fibres fit for weaving and ropes, there are chiefly two which may thrive with us, viz. *Urtica nivea*, of which the Chinese make their linen; and *Phormium tenax*, the New Zealand Flax, which surely may be cultivated successfully in South Hungary and Dalmatia. With *Urtica nivea* I tried experiments in Slavonia, and it thrives there very well. Another day I shall have the honour to produce a report on this subject. Further worthy of notice for Austria are *Myrica cerifera*, which yields a vegetable wax, and *Arachis hypogæa*, which yields an oil. In Paris a Society is established, with the presidency of M. Geoffroy Saint-Hilaire, for the purpose of acclimatization of useful animals; and it is expected to be of great use. I proposed to the Central Committee to join this Society, in

order to get their monthly transactions, which may be directed to the First Section of our Society.

Every department at the Exhibition at Paris offered abundant material for learning, and the merit of the French Government cannot be acknowledged sufficiently. I seize the present opportunity to express my most dutiful thanks to his Serene Highness the Prince President, and to his Excellency the Minister of the Interior, for the official mission I was entrusted with, and which rendered it possible for me to study in detail particularly the economy of the forest, agriculture, and the professions connected with it.

Excursion into the Interior of NAVITI LEVUE, *the principal of the* FEEJEE ISLANDS; *being extracts of a Letter from* Mr. MILNE, Botanist of H.M.S. Herald, *during the Survey of those Islands under* Captain Denham, R.N., *dated* Island of Ovolau, Feejee, Oct. 7, 1856.

In my last letter from Sydney, dated May 21st, I mentioned that I anticipated another journey into the interior of Naviti Levue. A party was formed by Captain Denham, consisting of Dr. M'Donald, the Rev. Mr. Waterhouse, and Dagual, the Captain's coxswain. We finally left the ship, in one of our own boats, on Friday, the 13th of August, well supplied with calico, hatchets, knives, etc., to clear all expenses with the natives in the interior. The first day we arrived at Bau.

Saturday, Aug. 14th.—We left Bau in a large double-canoe, having a single-canoe and a small dingy in company. As we entered the river, the country was flat and somewhat undulating, and more or less in a state of cultivation. On ascending the stream, nothing could be more enchanting; both sides were one mass of Mangrove-bushes, with their adventitious roots hanging to the surface of the water. Here and there were Breadfruit-trees, showing their incised foliage, with the fruit in a state of formation. Much more striking were the Cocoa-nut, and a stately Palm, a species of *Areca*. We called at several towns, visited their heathen temples, obtained a great deal of information in regard to the residence of their gods. To dwell upon such topics would not be botany. But I must restrict myself as much as possible to the vegetation of the country. As we ascended the stream, the features of the land continued much the same; at intervals the fresh-water fish

and the wild-ducks rippled the surface of the water. We reached the Christian town of Navusa, where we found the chief, Kama Naitasiri, the highest chief in the district.

Sunday, 15*th*.—We spent the day at Navusa, where, through the able assistance of Mr. Waterhouse, arrangements were made for our future proceedings. Kama Naitasiri assented to form one of the party and introduce us to his people on our way up the river.

Monday, 16*th*.—We left Navusa for Naitasiri, being the next Christian town on the river. We had a ship's long-boat, called the 'Victoria,' belonging to the Rev. Mr. Moore; it formerly belonged to the ship 'Lady Franklin,' at the time a mutiny broke out close to the Feejee Islands, when a number of convicts escaped from the ship in the above boat: it was retaken by Captain Denham at Ovolau. The small dingy and a single-canoe formed our armada. In passing along I saw great clumps of Tree-ferns, belonging to the genus *Cyathea*. The *Areca* Palm was becoming more frequent; the fruit at all times is from five to six feet from the apex, encircling the stipes. It is not unfrequent to see large clumps of these beautiful trees upon the face of the banks. Several species of *Convolvuluses* now adorned the sides with their white, pink, and blue flowers, and a species of *Crinum*, with white flowers, are frequent in woody places along the banks; so that, what with *Gramineæ* and *Cyperaceæ*, there was ample scope for a collector; but I was somewhat confined in my researches, being in charge of the boat, and, owing to the intricate navigation, with all our caution more than once we got aground. At 8.30 we arrived at our place of destination, and found Dr. M'Donald, with Mr. Waterhouse, quartered at the teacher's house.

Tuesday, 17*th*.—The weather being somewhat unfavourable, we did not prosecute our journey. I went out collecting with the chief, Kama Naitasiri, through a fine woody country, and found several interesting shrubs, which fortunately were in flower. One belonged to *Scrophularineæ* (in this instance there were only two stamens, as in *Veronica*), and another tree belonging to *Leguminosæ*. It was past flowering. I only saw one seed-pod. There were several other species of shrubs, and a number of Ferns. Two of the latter in particular attracted my attention; one with broad, compound fronds, the indusium somewhat reticulated, and having young plants proceeding upon the points of the fronds; the other, I think, belongs to the genus *Dicksonia*, if I may

judge from the nature of the indusium; however there is no room for description here. I collected a number of other things, but nothing I had not found in December, 1855.

Wednesday, 18*th*.—We left this place and ascended the river, leaving the 'Victoria,' and taking a number of smaller canoes instead of the larger ones. As we passed along the stream, the country became a flat plain, in a state of cultivation, having all along the sides of the banks great numbers of Shaddock-trees (*Mole* of the natives), large trees of *Calophyllum* (*Damue* of the natives); patches of Yams and Taro were frequent; Cocoa-nuts and Breadfruits were less numerous. We arrived at a town called Tausau, where we remained for the night, and started the following morning up that branch of the river called Wai Nelina. The country thus far still continued to be flat. In passing along, we came to a place where we found several women manufacturing Turmeric [*Curcuma rotunda* or *longa?*—Ed.], and upon the sides of the river were large quantities of refuse. In a small house close to the water there were two pits, eighteen inches deep, lined with Banana leaves, and made water-tight; also a number of posts set into the ground, having rough bark, to be used as graters. When a quantity is grated, it is committed to the pits,where it remains for some time, and is afterwards carried to a canoe, then strained through a close-worked basket lined with Fern-leaves, and then put into short Bamboos, where it remains for four nights and four days, when it is fit for use, and forms one of the principal articles of food, made into puddings, mixed with grated sugar-cane. It is used also for covering children after birth, and painting the bodies of women previous to strangulation. There was a species of *Ficus* in great abundance, with small foliage, all along the high grounds, and a number of other plants which I did not recognize, owing to the distance; but it was evident the features of the country were fast changing. Here and there were deep ravines, and the sides of the banks lined with vegetation of a different aspect. At the same time the river became more tortuous; at times we were going south, at other times we were steering due north. It was with great difficulty we made any progress, owing to the force of the rapids. On coming to a sudden turn of the river, immediately to the right was a Bamboo-forest, and right ahead was the mountain of Ambuga Levue, and a number of other detached conical peaks bearing to the south, intersected with deep craggy ravines, and thickly covered with vegetation.

Here is a fine panoramic view, in fact one of the finest in the whole course of the river. The scenery was picturesque in the extreme. On the banks was abundance of what the natives call *Lololalo*, or Native Fig, with large clusters of fruit covering the stems, and another tree which the natives call *Nelawa*, and which bears great quantities of fruit.

As we went along, the Shaddock became more and more plentiful, here appearing to be the principal feature of vegetation. There is also a tree called *Makasoa*, used for upright posts for houses, but is not durable. As nothing came under my notice regarding the vegetation, I will pass over our proceedings until we arrived at the town of Vunbua, where we remained for several days in consequence of the heavy rains. Vunbua stands upon the top of a mountain, about two miles from the river, and two miles from Ambuga Levue. Now, for the first time, we were in a mountain woody district. Close to this town I saw several trees of a white variety of *Erythrina Indica*, some of the flowers of which I put into spirits, and these will be sent with my collections. The only difference I could observe was in colour. A large tree was also near to the strangers' house, a *Hibiscus;* it was new to me. I found also a remarkable species of *Piperaceæ*, which is not upon the coast, called *Angania laki* (*laki*, short); it is quite different from the *Angania nelina* (*nelina*, true). It is only the roots of *nelina* that can be used as a liquid [Kava?—Ed.]; both roots and stalks of the *laki* can be employed, and it is then much stronger and more intoxicating, besides being pleasant to the palate. The foliage and habit of the plant are peculiar; and I have a fine specimen of the root, which will be sent for the Museum.

The day after our arrival being Sunday, I did not attempt to go out collecting; but early on Monday morning, although the weather was unfavourable, I went out to have a day in the woods. As I entered the forests, I saw a climbing plant with pink flowers, belonging to *Melastomaceæ*, covering all the bushes with its clusters of waxy flowers. There was another beautiful shrub, with white flowers, which, upon examination, I found to belong to the Order *Boragineæ*. I collected a number of Ferns, which are to be found on the other islands in Feejee, and a few that I had not seen before. There was one with small crisped fronds, upon decayed wood; it is nearly allied to *Hymenophyllum*. There was also another, I think belonging to the same genus; both may be considered rare, if not new. A number of *Cryptogamia* and

Fungi came into my hands, several *Hypnums*, etc., that are not frequent upon the other islands in Feejee. Among the trees which are not upon the low grounds, I saw several fine Dammaras; the largest measured 23 feet in circumference, and were about 80 feet high. I inquired for the *Nelakua salsalu*, but it does not exist in the district. There were several species of *Lycopodium*, but only one that I had not found on my former visits.

For some days we had incessant rain, but on Thursday I was determined to make the best of the day, whatever the nature of the weather might be. Accompanied by two natives, I took to the woods, but in a different direction to what I had been before. Owing to the unfavourable state of the day, it was with some difficulty I could prevail upon the natives to remain, and without them I could have made no progress. I found a young plant belonging to *Coniferæ*, with leaves like a *Taxus* (*Kau solo* of the natives), and soon I saw one tree growing 60 to 70 feet in height, and 8 feet in circumference, perfectly straight. It was in vain I could tempt these people to ascend for specimens; they declared it was impossible. I have however a specimen in my possession; it was taken in a young state, and I enclose a part for your examination.* On my way through the woods, I found a number of fine Mosses in fruit, but have collected the same species at Ovolau. In descending a deep ravine there were large plants of *Marattia*, their long fertile fronds covering a large space of ground. Many of them were formed into trees; and I think there are two species of *Marattia* in Feejee. On coming to a considerable mountain-stream, I got two species of parasitical Orchids. After securing them in my box, a few minutes' walk brought me upon the margin of that beautiful river which is only to be found in the interior of Naviti Levue. The branches of the trees were hanging over the water, literally covered with Mosses and Lichens; a large tree was in flower, of exquisite beauty, belonging to a Natural Order unknown to me; another tree was in flower of a cream-colour, Order *Myrtaceæ*. Both sides of the banks were lined with Ferns, such as *Asplenium*, *Aspidium*, *Dicksonia*, *Davallia*, etc. There is a species of *Urticaceæ*, which the natives are very much afraid of; and well they may be, for if you should be so unfortunate as to sting yourself, you will feel the consequences for some months. I

* It appears to be an entirely new species of *Podocarpus*, allied to *P. cupressina*, Br. in Horsf. Java, p. 35, t. 10.

am at this moment suffering from its effects, from an accident which occurred a month ago. There is no eruption, but it is most painful when exposed to the influence of water. In some places this Nettle is called *Kau Tambua;* it is best known as *Salato.* I also collected several Grasses, which are not common. A large species of *Flagellaria* was climbing up the trees, quite distinct from the one at the Isle of Pines, as you will find upon examination. The rain came down in torrents during the whole day; and it was with some reluctance I returned to the town about three o'clock. I found there was more for me to do. A native had brought a cone of what they called *Nelakua laki:* I also found there was another, named *ambalavu,* which they said were both quite different from *Nelakua nelina;* I therefore lost no time in going off, with a native, to the town of Bacindua, five miles distant, and got specimens of the *laki,* with cones, also the *ambalavu,* at a place called Sobel, on the face of a hill covered with wood, close to the river between the last-mentioned town and Vumabua. I was at first inclined to think they were different from the *Nelakua nelina;* but from a cone and specimens afterwards obtained at Namosi, it turned out there was no difference. In this way the distinction takes place amongst the natives: anything short and thick is termed *laki;* when long, *ambalavu.* The following is an account of the Conifer which I sent in to Captain Denham. "The natives recognize two sorts of *Nelakua nelina, Nelakua ambalavu* (long), and *Nelakua laki* (short), characterized by the habit of the trees, and resulting from the position, exposure in the open country, or protection amongst the forest-trees, and other circumstances that might influence its variation; but from the minutest examination of the cones and foliage, they appear to me to be referable to one species of *Dammara, Nelakua salsalu.* The generic term *Nelakua* has no doubt been applied to this tree by the natives, from the comparison of the tissue of the wood with that of the *Dammara,* as the foliage would not be likely to indicate any alliance to the untutored eye. *Vaivai;* this tree we discovered on Wia Manue: examples were seen between 80 and 90 feet high, and 13 feet in circumference. *Kau solo;* the only example of this that fell under our observation at Vunabua, on the Wai Nelina, or True River, appeared to be about 60 feet in height, and perfectly straight, foliage similar, but smaller than that of the *Vaivai. Kau Tambua,* occurring at Hamasia, on the Wai Nelina, has foliage smaller than that of *Nelakua salsalu,* but in

other respects it resembled it. Trees observed appeared to be young, and attaining the height of about 14 or 16 feet." Such was the report on these supposed Pines. Before I close this I shall have occasion to take notice of these trees.

Wednesday, 25th.—The weather being more settled, it was thought advisable to prosecute our journey. We reached the town of Nondravu, where we remained for the night, in the Burasau, and started the following morning, Thursday, and reached the town of Suivau, where we found boiling springs: they were indeed boiling springs, unbearable to the touch. There was no time for collecting. We always left the towns early in the morning, and had late arrivals. The features of the country had changed considerably. There was mountain after mountain rising above each other, with their bold, craggy precipices; there were the grey rocks, covered with Lichens; and large, noble specimens of *Dammara*, covered with leaves of a rich green. We arrived at the town of Namosi on Friday the 28th, and were met by a white man called by the whites of Feejee Harry the Mountain; his proper name is John Humphrey Damford; he has been fifteen years amongst the inland tribes, and to that man we were much indebted. Namosia is a large town between two mountains. As we entered this place it was disgusting to see great quantities of human bones in the branches of the Shaddock-trees, as one would think on purpose that the odoriferous blossoms might overpower the odour from the human flesh in a state of putrefaction; there were also great numbers in the branches of a species of *Barringtonia*. These two last-mentioned trees seem to be their favourite ones for that purpose. There were some hundreds of small stones, neatly set into the ground, every stone indicating a murder. We were informed by Harry that six men had been killed by the chief Nelua Nelua on the coast, and a part of the bodies sent to the chiefs of Namosi, as their share of the food. A portion of this revolting food was brought for inspection. I visited the grave of the late chief, and found a number of skulls and other human bones. They worship the spirits of their fathers; at all times portions of food are to be seen upon the graves to feed the supposed spirits. One of our party saw a man's hand overhanging the fire-place, in the smoke, in one of the chief's houses. The day before we left this place a man and woman were strangled.

Saturday.—As usual, it was raining. I went out with one of the

young chiefs and two of his slaves, into the mountains, and found a few interesting plants; one in particular attracted my attention, from its ornamental habit, with pink flowers. I got a few seeds, and hope they will turn out good; Order *Melastomaceæ*. Several *Orchideæ* were hanging from the trees, of which I procured plants. One thing was very much against me; I had to leave my paper at Vunabua, as it was utterly impossible to get anything heavy up that shallow stream: I was in the hopes of getting a small portion taken to Nomosi, for any plants which might come in the way. When I mentioned my desire to Mr. Waterhouse, he said, If so, you will have to carry it. The paper was left, much against my will. I went out every day, and brought in fresh specimens, that they might keep until I got to Vunabua, where I could transfer them to paper. I found a number of fruits: I am afraid they will not keep, being too green when taken from the trees. I was informed by Damford that a small-leaved Pine was in the district; also a tree with a strong aromatic smell, the bark being used by the natives as an astringent. I found both species; the former I think is a Pine, and I got a small section of the wood, and enclose a small specimen; the latter, a *Laurus*, the *Nelakua nelina*, is plentiful in the district. The Gum, or *Mackandra* of the natives, is used for burning in the houses in place of oil. There are very few Cocoa-nut-trees inland; on that account oil is scarce.

Tuesday, September 2nd.—I went out into the mountains with my young friend the chief, and found two Ferns, which were new to me; one an *Asplenium;* as for the other, I have had no time to examine it. I found a number of other things, and several Orchids.

Wednesday, 3rd.—We left this depôt of cannibalism, with my boxes well filled with specimens and plants; but poor Damford was crying like a child; perhaps we were the last white men that he will ever see. I will pass over our descent until our arrival at Naitasiri. I was informed that a number of large trees of *Nelakua laki* were to be seen in the woods; so with one of the natives I went out to find them; certainly they were among the largest I had seen. They measured from 18 to 27 feet in circumference, and from 40 to 90 feet in height. I obtained both cones and young plants, which are in my possession. This district is richly wooded. We left Naitasiri, and ascended the river for some distance, and took to another branch of the river, called Uluna Nelina, and got as far as a town called Koro Ubautan, when

we were turned back by the natives. We returned once more to Naitasiri. We afterwards explored the Wai Manue, one of the most important districts in the large land; it leads off from the town of Navusi. When you ascend this river for fourteen miles you are in the heart of a mountain forest, where large trees abound close to the sides of the river. It was here where I found the *Vaivai*, and fortunately young plants, which are at this moment in a good condition. I measured a very large tree, 13 feet in circumference, and from 80 to 90 feet in height, and also found a number of young plants of *Salsalu*, which is doing well. The natives speak of six different sorts of *Domue*, genus *Calophyllum* (?); there is *Laki ambalavu*, and so on; I only make out three. I collected a number of the branches and dried them. I will send as many of the native names as possible. The timber in this district is in general useful, and with little trouble could be floated down to the sea. There was one fine flowering shrub on the banks of the stream, and I have got two young plants. Amongst the stones in the bed of the river, was what appeared to be a small flowering *Torina*, and another interesting plant climbing over the tops of the bushes; it is called *Wa nelakua*, from the close resemblance of the foliage to the *Nelakua nelina*: there is a great similarity in the venation. It belongs to *Liliaceæ*, and answers to all the characters of that Order. I have secured one young plant. There is a tree also which bears large quantities of gum, which has a strong smell of camphor; I obtained one young plant, with gum, and found a number of other good things in this district, and there is a great deal more to be done. I am in hopes that a survey of the river will take place, and am certain Captain Denham, with his usual love for the advancement of science, will not lose an opportunity of exploring the botany of Naviti Levue. On the heights of Koroa, on the Wai Manue, Mr. M'Donald had the good fortune to discover fossil impressions of the roots of trees, small forked branches occurring in stratified rocks, on which the town stands, and at an elevation of about 400 feet above the level of the sea. The vertebræ and larger bones of fishes were also detected. None of the vegetable woody tissues were discoverable in the fossils. I shall omit the particulars of our journey down the river, as nothing particular occurred.

We finally arrived at Ovolau on Wednesday, September 24, and remained on board, amongst my specimens and live plants, until the

morning of the 27th, when I left the ship in a small dingy, which was going to the island of Makongai. This island, like many of the other Feejee Islands, was almost destitute of vegetation. I travelled round three parts of the coast, and found nothing worthy of notice. It is about 900 feet in height on the face of the hills, and in the shallow ravines there is certainly a number of trees intermixed with shrubs, but I observed little worthy of notice. On travelling over its highest summit I found a few straggling Cocoa-nut-trees, also a number of *Pandanus*-trees in fruit, and of course made a collection as usual. I ought to have mentioned that the small dingy was sent to the above island with four days' provisions for two of the ships' boats, which are surveying the surrounding reef, etc.; and Captain Denham, with his usual kindness, did not fail to give me an opportunity of proceeding thither, that I might examine its botanical character. In conclusion I may state that all my live plants are planted in boxes; the Rev. Mr. Binner has been so kind as to give me full permission to make use of his garden and a small summer-house, where they are now in very good condition.

BOTANICAL INFORMATION.

Notes on the Vegetation of the Island of St. Kitt's (West Indies); being extracts of a Letter from the Governor, HERCULES G. R. ROBINSON, ESQ., *dated* Government House, St. Kitt's, January 29, 1857.

"I must mention to you however that I am but a poor botanist, and I will not therefore send you anything until I hear from you, as I might only send you things which, though they might appear to me very beautiful, might bear no value in your eyes. We have several gentlemen in the Island who have a little smattering of knowledge upon the subject, and we have many very beautiful gardens, full of plants and flowers, which have been imported from every quarter of the globe. We have innumerable kinds of Cactuses, the names of which I am unable to give you. Within a mile from this house there are several hundred acres of hilly, uncultivated land, literally covered with the *Turk's Cap Cactus*. I can send you any quantity of them which you would care to have. All sorts of Cactuses appear to grow peculiarly well here, and attain a great size. The fences are almost

all formed of the common *Prickly Pear*, which makes an impassable boundary. What an excellent protection it would be on the glacis of fortifications, better than any 'abattis,' as fire will not burn it, nor artillery injure it, and it is impassable to man or horse! Sir Hans Sloane, in his history of St. Kitt's, mentions that when the island belonged to the English and French, a law was passed, directing a triple row of Prickly Pear to be planted across the island, as the boundary between the two quarters, so as to put a stop to the perpetual attacks which they were in the habit of making on each other. The juice of the fruit of this Cactus is a beautiful blood-red dye, and is much used here for colouring jellies and confectionery, and, I believe, cloth. We have also a Cactus called the *French Prickly Pear*, something like the other, without the thorns, and I do not think it often bears flowers, at least I have never seen it in flower. The only thing remarkable about this Cactus is its supposed hair-growing properties, when the leaf is split open and applied to the head as a hair-wash; it makes a beautiful lather, and whether it makes the hair grow or not, is a very pleasant wash. I have lately imported the Nopal Cactus (or *Cactus cochinellifer*, Linn.), with a view of propagating the cochineal, and my plants are growing beautifully, and will be ready for the reception of the insect in a few months. A beautiful dwarf Cactus grows here, the flower of which is exactly like the star-fish. I do not know if this is any curiosity; if so, I would send you a few plants.

In the Palm tribe we have not a great variety. Our woods abound with the *Mountain Cabbage-Palm* (*Areca montana?* Ed.); and we have also the noble *Palmetto Royal*, described by Sigou, which grows to an immense height. We have also forests of the *Gru-Gru Palm* and the *Mocow;* we have also some beautiful specimens of the Areca Palm, which is very like the Palmetto Royal, and the *Screw-Pine Palm** or *Pandanus:* I can send you seeds or young plants of any of these. But I must not omit to mention a *dwarf Palm*, which grows in the Island of Anguilla, a dependency of this Government. I never saw this Palm anywhere else, and do not know the name; it grows over the whole island, and is called by some the *Dwarf Palm*, and by the Anguillans the *Thatch Palm*. I see Coleridge describes it as the "*Tier-Palm*, the smallest and most delicate species of that great Fa-

* Probably the *Pandanus candelabrum*, P. de Beauv., introduced from the coast of West Africa.—Ed.

mily." It is certainly the most beautiful little tree I ever saw; it never exceeds in height eighteen inches, and the natives use it to thatch their houses, and make hats, fans, and mats from the leaves. I could easily send you this Palm in a Ward's case.

In Ferns and Mosses we are very rich. I am not learned enough to give you the names, but our mountains abound in them; and I am told by the best botanist in the island that there are many of a rare and valuable description, not found elsewhere. We have them of all sizes, from the giant Fern, growing on a stem thirty feet in height, to the dwarf. Mrs. Robinson is a great collector of Ferns, and if you will supply her with a *large* book of the proper kind of paper, she will be most happy to make you a collection of both Ferns and Mosses. The great fault in all the specimens I have seen here is, that they lose their beautiful natural colour; this might perhaps be obviated by proper paper.

No language can describe the beauty of some of our mountain-rides in the neighbourhood of Mount Misery; the *Ceiba*-tree and the *Fig*, and numberless others, covered with *Orchids*, *Wild Pines*, *Creepers*, and *Parasites*, in the greatest profusion. We have one beautiful *creeper*, which completely covers the tree upon which it grows, and is one mass of purple blossoms: it is called the *Purple Wreath;* and some beautiful varieties of the *Ipomœa*, *Aristolochia*, *Convolvulus*, *Solandra*, etc. etc. The Frangipani-tree grows wild in part of this island, upon the shores of a salt pond, and there are several varieties, white, pink, red, etc.: I do not know if you would consider them of any value. The *Patchouli* plant grows in Nevis: I could send you some of it if you wished.

We have the *Croton variegatum* in almost every garden, and the *Variegated Pine-apple:* the latter very ornamental, but the fruit far inferior to the Black Antigua Pine. I could send you plants of the *Croton variegatum* if you would wish for them; and I dare say some of the *Pine-apple* also.

The *Earth Nut*, or Ground Nut, is successfully cultivated here, but only for home consumption; we might however grow any quantity of it if we were sure of a market. What price will the article bring in England? We do not know anything of the *Sesamum*, at least by that name: what is it? Indigo is indigenous, and grows wild in every hedgerow. The *Annatto* (*Bixa Orellana*) is very common; the seeds

make a beautiful dye. The *Moringa*-tree grows over the whole island; the root of it is an excellent substitute for horse-radish; and the Oil of Ben, which I understand is valuable, is made from the seeds; but its value here is not appreciated, and no one appears to have sufficient energy or knowledge of the mode of manufacturing it to undertake the process.

The "air-plants," with which doubtless you are familiar, grow abundantly here.

A very ingenious man in Montserrat, a Mr. Burke, has invented a machine for cleaning fibre. I could send you a sample of the Banana, Plantain, Aloe, Pine-apple, Snake Grass, and other fibres, but I dare say you have specimens in your Museum.

We have not got the "Chinese Grass-cloth," and I should be very thankful for a plant or two when you are sending a Ward's case.

Walnut-trees have grown here, but there are none at present. The Nutmeg and the Almond succeed well.

We produce a large quantity of both *Arrowroot* and *Tous-les-mois*. The latter is the root of a plant somewhat like the common Indian Shot, but not that species; it is much larger, and bears a bright red flower. I will send you by the next steamer a small sample of 25 lbs. of our *Tous-les-mois*, so as to enable you to form an opinion as to the quality.

English vegetables grow well here on the mountains, at an elevation of 500 or 600 feet. Peas, Beans, Kidney-beans, Spinach, Turnips, Carrots, Lettuce, Cabbage, Radishes, and some others, the seeds of which I got out the other day, are all doing well; but I got out at the same time some bundles of Strawberry plants, packed in gutta-percha, and they were too far gone, and have died. Perhaps you could send me a few plants in the case you kindly promise.

Mr. Seymour, who has just been appointed to Honduras, is at present on a visit here. He leaves for his new government in a few weeks. He desires me to say, that if you would wish for any of the vegetable productions of Central America, he will be very happy to supply you with them.

The Royal Mail steamers touch here, so we shall find no difficulty in carrying on our exchange of plants, etc. If you will let me know by the mail before you send a 'Ward's Case,' I will have a careful boat in waiting to receive it."

[We heartily wish more of our Colonial Governors were willing to send us as interesting an account of the vegetable products of the countries under their sway as that with which this gentleman has favoured us. We have received, through Governor Robinson, a Catalogue of a really rich collection of plants in the garden of Mr. Davis, of St. Kitt's, a collection that would do credit to any European garden.—Ed.]

Mr. Burke's *Fibre-cleaning Machine.*

[In our preceding article mention is made by Governor Robinson, of St. Kitt's, of the successful invention of what has been so long a desideratum, a *Fibre-cleaning Machine.* We have just been favoured by a correspondent in Antigua with the following account of this. The machine has already been tested in London, and now in the West Indies.—Ed.]

"The importance of some invention for rendering available for manufactures the numerous fibrous productions of the tropics has long engaged the attention of practical men in all parts of the world. Thousands of pounds have been expended on experiments of various kinds, chemical and mechanical, for the attainment of this desirable object; but failure attended them all.

"It unfortunately happened that the parties who devoted most time and money to the pursuit of the design were comparatively ignorant of the plants they intended to operate upon, and judged of them and their structure by their knowledge of the flax and hemp of Europe. The greater part, if not the whole, of the mechanical contrivances for cleaning Plantain, Aloe, and other tropical fibrous plants, were designed on the principle of crushing and combing out the pulp, and leaving the fibre in a condition similar to that of flax, when taken from the scutch-mill and ready for the hackle; but the principle being unsuited to these plants, the inventions, one and all, failed, to the ruin of many ingenious and clever men. The Hon. Francis Burke, of Montserrat, has long had his attention drawn to the importance of turning to account the fibres of these islands, especially the beautiful material to be procured from the Plantain, which is extensively cultivated in many of these colonies on account of its healthy and nutritious farinaceous fruit, which is used in many places, as in Demerara, as the principal article

of food of the people. Thousands of tons of the fibre are annually left to perish, from the want of some suitable apparatus for fitting it for the hand of textile manufacturers. Mr. Burke for several years has been experimenting in various ways on the Plantain stem, and neglected no opportunity of proving the success of the inventions occasionally put forth by others; but he found them all to be unsuited to the peculiar nature of the plant. He has been fortunate enough however to invent a machine which fully answers the design, and which carefully and expeditiously clears the fibre from all the vegetable pulp, and leaves it beautiful and white, fit for the manufacture of the coarsest cordage or the finest textile fabrics. The fineness, the strength, and silky appearance of the Plantain fibre have long been known; but the difficulty was how to make it available at a sufficiently economical rate to supersede other coarser but more easily obtainable materials. This, we believe, has been fully achieved by Mr. Burke. His machine, which is patented in England, France, Belgium, and the United States, has been successfully proved, and is undoubtedly all that the most sanguine expectations of the inventor could have led him to hope. Some two years since we mentioned this machine, and its successful operation in Montserrat, where a roughly made one had been brought into use by Mr. Burke, but which was sufficient to test the efficiency of the principle. Since then Mr. Burke visited England, and has succeeded in perfecting his apparatus in a surprising manner. It now appears wonderful that the construction of so simple a piece of machinery should so long have baffled the skill of the best practical engineers and machinists of Europe. That such has been the case must be attributed more perhaps to the want of knowledge of the nature of the plants to be operated on, than to any want of skill on the part of previous experimenters. This knowledge a long residence in the West Indies supplied Mr. Burke with, and now he has turned it to profitable account.

"One of the patent machines is now in this island. Yesterday Mr. Burke exhibited it in full operation on Green Castle estate, the property of Mr. Law, in the presence of a large assembly of practical agriculturists, and the principal men of the island, who went to see the important invention. We noticed that his Excellency the Governor-in-Chief, the Lord Bishop, the Chief Justice, the Archdeacon, Mr. Musgrave, and other officials were present, as well as Mr. Bispham, Mr. John Gray, Mr. Bourne, Mr. Barrett, Mr. Kennington, Mr. Roden,

Mr. H. Simpson, Mr. J. Lake, and several other gentlemen whose practical knowledge places them in the front rank among agriculturists. We also observed several scientific and professional gentlemen, including Doctors Nicholson, Ledeatt, and O'Kearney, who took a lively interest in the matter, all of whom appeared highly pleased with the working of the machine, and expressed their approval of its action.

"Various fibrous plants, such as the Aloe, the Snake-Grass, the Plantain, and the blades of the Pine-apple plant, were subjected to the cleaning process, and in all cases the experiments were successful. After passing through the machine, the fibre has only to be washed to free it entirely from the pulp, and when dried it is fit for exportation. The fibres of the plant are not broken nor injured in any way, but come out in their entire extent, which, if not cut for the sake of convenience of handling, may be had the whole length of the plant.

"We learn from a recent number of the 'Society of Arts Journal' that one of the machines was exhibited in the Society's rooms, in London, with the most gratifying results, in the presence of the leading men of London who take an interest in such matters. It is said, on private authority, that a gentleman largely engaged in manufacturing operations offered to take any quantity of fibre such as was exhibited at £33 per ton.

"A gentleman from Demerara, who was present yesterday at Green Castle, spoke in terms of high admiration of the invention, and expressed his confidence in the immense value it would prove to that colony. It is the belief of every one conversant with the importance of Mr. Burke's invention that his fortune is made, a circumstance that will give a high degree of pleasure to his numerous friends in this part of the world; he is highly deserving, and is greatly esteemed by all who know him."

Scientific Exploring Expeditions of the British Government.

Besides the researches that are now being carried on by Mr. Gregory's Expedition in the Interior of North Australia, and the survey of the Fejee and adjacent Islands of the South Seas, by Captain Denham, in H.M.S. Herald, each of which has a zealous botanist attached to it, we are proud to be able to announce three others which are about to be immediately undertaken, and which cannot fail to promote our know-

ledge of the vegetable productions and of the physical distribution of plants in other and very different quarters of the globe.

1. *The further Exploration of* "Kwóra *and* Benue" (or, as they have been commonly called, the *Niger* and *Tsádda*), by Dr. William Balfour Baikie, R.N., etc.—The eminent success which attended the researches of this gentleman in his survey of these waters, as described in his 'Narrative'* lately published, having returned without the loss of a single man of his company, has induced the Admiralty to fit out another expedition for further investigations in the same region; and what was felt to be so much wanted on the last voyage, is happily supplied on the present occasion. Mr. Barter, one of the most intelligent of the gardeners in the Regent's Park Botanic Garden, has been appointed botanist to the expedition, and if his life and health be spared, the results cannot fail to be of great importance. A suitable vessel is preparing for the voyage, and Dr. Baikie and Mr. Barter take their passage to Sierra Leone by the Royal Mail steamer during this month, April, to make preparations there, and await the arrival of their own vessel a few weeks later. May every success attend them!

2. *Survey of Vancouver's Island and the adjacent Coasts of British North America*, by Captain Richards, R.N., in H.M.S. Plumper.—This, we need hardly say, is another Admiralty survey; and, though no one accompanies it in the *exclusive* character of botanist, yet we know that the Commander will afford every facility to his officers for collecting plants, and the surgeon, Dr. Forbes, and assistant-surgeon, Dr. Campbell (the latter being more especially charged with the duties of this department), will feel it a duty and a pleasure to prosecute botanical researches whenever they have the opportunity; and they are supplied with the means of collecting and preserving plants. Vancouver's Island cannot fail to be exceedingly interesting to the botanist. No one, we believe, has ever set foot upon it, save the excellent Menzies, during the voyage of Capt. Vancouver; and, lying as its northern portion does, in the same parallel of latitude with the South of England, its vegetation would be well suited to our climate. It abounds in mountains and forests, and is said, like the adjacent continent of North America, to possess many kinds of Pines; but as the atmosphere is considerably

* 'Narrative of an Exploring Voyage up the rivers Kwóra and Benue, in 1854, by William Balfour Baikie, M.D., R.N., etc. etc., in command of the Expedition. Murray, 1856.

influenced by the North Pacific Ocean, to which its western shores are entirely exposed, the vegetation will probably be found to be affected thereby, and we may expect some novelties.

3. *An Exploring Journey into,* what we may fairly call a hitherto unknown portion of, *British North America,* conducted by J. Palliser, Esq. —The boundary-line between the western United States territories and the British possessions to the north being fixed in the 49th degree of latitude, and Vancouver's Island having begun now to be colonized, it has become a matter of great importance to form a more ready communication than we yet possess between our Canadian possessions on the east, and Nootka Sound and Vancouver's Island on the west, of this vast continent. The only available route across the Rocky Mountains, and that a very difficult one, we believe, is that by Jasper House fort. Mr. Palliser, well known for his enterprising, and especially his sporting excursions in the upper valley of the Missouri, and even thence into the British possessions at White Earth river, has volunteered to the Geographical Society to make researches, and conduct an expedition with the object above-mentioned in view. His services have been accepted by the First Secretary for the Colonies; the Treasury have issued the needful funds; and Mr. Palliser, accompanied by his staff, will sail for New York on the 4th of April, and proceed thence, by way of the upper branches of the Missouri, to the plains of Saskatchawan. The plan, if possible, is to cross the Rocky Mountains, so as to pass the winter on the west side, where that season is so much milder and of shorter duration than on the east, in the same latitude. But what most concerns us is, that the Colonial Office readily granted permission to send a botanical collector on this expedition; and the choice has fallen on, and the appointment been accepted by, Mr. Bourgeau, one of the most experienced and best of the many collectors of the present day, as the herbaria of almost every botanist in Europe can testify. For eight or ten years past Mr. Bourgeau has been wholly occupied in collecting and preserving, in the most beautiful manner, the vegetable riches of Spain, and other countries of the south of Europe, Algeria, the Canaries, etc. etc.; and we anticipate collections from the region in question scarcely less valuable than those of Sir John Richardson and the late Mr. Drummond, and which will go far towards completing our knowledge of British North America.

NOTICES OF BOOKS.

MOORE, THOMAS, F.L.S.; INDEX FILICUM: *a Synopsis, with Characters of the Genera, and an Enumeration of the Species of Ferns, with Synonyms, References, etc. etc.* 12mo. London: Pamplin. 1857. Part I.

This promises to be a very useful publication, and to be equally creditable to the author with his excellent 'Handbook of British Ferns,' and his recently completed 'Ferns of Great Britain and Ireland, Nature-printed,' etc. There is no lack of manuals of British Ferns; but what has long been a desideratum is a cheap work in popular language on Ferns in general; and we know no one more competent to carry out such a work in a manner that shall supply this want than Mr. Moore. Species in great numbers are described in books, and genera *usque ad nauseam.* The present work is professedly "mainly a compilation." "Free use is made of the statements, critical or otherwise, of those botanists who have devoted attention to the subject, the whole being blended with such personal information as the author has been able to bring to bear on the subject." The labour of such a work however is not light. A host of publications, and many of a very expensive character, have to be consulted; and then comes the great difficulty of what of the many new genera of modern authors have to be retained, and what to be rejected. Nor is the difficulty less in the selection of species. In the determination of genera he can use his own judgment, because there are but few of which he cannot consult some or other of the species, while multitudes of new species are only known to those who have, too often *imperfectly*, described them. In regard to the former, the author professes to hold a middle course, "between the excessive subdivision, and the equally inconvenient non-division of the older genera."

We heartily wish the enumeration of species (unaccompanied, we fear, by any specific characters or distinguishing marks) could have immediately followed the characters of their respective genera. Here the characters of all the genera are first given, a few examples only of species; while the species are to follow apart from the genera. Still more do we regret to learn that they "will be arranged in alphabetical order, for facility of reference." Upon the same principle we do not see why

the genera should not be so arranged, as indeed was the case in this author's otherwise very useful 'Popular History of British Ferns.'

The publication, which is neatly printed on excellent paper, it is expected will appear regularly in monthly parts, and will contribute in no small degree to render the study of Ferns more popular.

PAPPE, L. M. D.; FLORÆ CAPENSIS MEDICÆ PRODROMUS; *or, An Enumeration of South African Plants, used as Remedies by the Colonists of the Cape of Good Hope.* Second Edition. 8vo. 52 pages and Index.

The excellent author of this work, Dr. Pappe, a physician, long resident at Cape Town, is well known as a scientific botanist, familiar with South African plants and their economic value. In our Report on the "Vegetable Products, obtained without culture, of the Great Paris Exhibition of 1855," we had occasion, at p. 114, to pass a very high eulogium on, and to make copious extracts from, his 'Silva Capensis, or, a Description of South African Trees and Arborescent Shrubs, used for technical and economical purposes by the Colonists of the Cape of Good Hope,' copies of which accompanied the well-prepared series of woods of the Colony sent to the Exhibition. We also alluded, in a note, to Dr. Pappe's 'Contributions to the Cape Economic Flora,' and to the 'Floræ Capensis Medicæ Prodromus.'

The work which heads this notice, is a *second edition* of that last mentioned. The first edition was intended as a commentary on a choice collection of Cape medical drugs, sent by Messrs. S. H. Scheuble and Co. to the Great London Exhibition of 1851 (and for which they obtained a well-merited prize); and it is gratifying to know that this was so well received that a new impression is now called for, and Dr. Pappe has not failed to make corrections and improvements and numerous additions.

Though modestly entitled an 'Enumeration,' the names of the plants are all systematically arranged (according to the Natural Orders) and accompanied by specific characters, the native, generally Dutch (sometimes the Hottentot) name, and remarks on the peculiar properties and uses; affording much information, not only useful to the inhabitants of the Cape Colony, but to the student of Materia Medica in

Europe. Yet the greater part of this information, it is candidly acknowledged, is due, not so much to scientific research in that now widely extended Colony, as to the experience of the Colonial farmer, residing in the more remote parts of the interior, to occasional travellers, or to the wandering native.

As specimens of the information we shall make brief extracts from the account of two drugs which are articles of export. After describing the *Bucku-leaves* (*Diosma crenata*, DC.) and their properties, it is observed, "In trade this valuable drug is often adulterated by the substitution of less powerful sorts of the same family of plants, which, although of a similar smell, are by no means equal to it in their therapeutical effects. One of these plants is the *Diosma* (*Barosma*) *serratifolia*, Lodd., a species common in the district of Swellendam, and another, the *Empleurum serrulatum*, Sol., easily distinguished by its linear-lanceolate, serrated leaves. The true *Diosma crenata* is a native of the mountains of Hottentot's Holland, Stellenbosch, Drakenstein, Talbagh, and Worcester."—And of the "*Cape Aloes*," under *Aloe ferox*, he observes, "They are procured from several species of this extensive genus, so peculiar to South Africa. The *Aloe ferox*, Linn., a native of Swellendam, is generally acknowledged to yield the best extract. That obtained from the *Aloe Africana*, Mill., is almost equally good, but not so bitter, nor so powerful as a drastic. It is the produce of the eastern districts. The *Aloe* commonly used by the Colonists, is prepared from the *Aloe plicatilis*, Mill., whose extract is a much milder purgative, and much resembles the Barbadoes Aloes. It inhabits the mountainous range near the Paarl, Drakenstein, and Fransche Hoek. It is much to be regretted that the farmers do not take more trouble in purifying this valuable drug."

At the Great London Exhibition of 1851, and that of Paris in 1855, nearly the whole of the "Vegetable Products" sent from South Africa were collected and sent through the indefatigable zeal of the botanists Dr. Pappe and Mr. Zeyher. No attempt seems to be made by Government to lay open the botanical resources of the Colony. A "Botanic Garden," as it is called, has indeed been formed at Cape Town, but we do not find that it has been in any way beneficial to the country, or that it carries on correspondence and interchange of plants with the Mother Country, or with other Colonial gardens. The services of Mr. Zeyher, who was for some time the Colonial Botanist, are entirely dis-

pensed with; and, if we are not misinformed, the so-called Botanic Garden is a mere lounge for the townspeople, attracted thither thrice a week by the presence of a band of music. We had hoped for better things under the present talented and enlightened Governor.

"*Untersuchungen über die Milzfarne Europas;*" *or* "*Asplenii Species Europææ;*" *by* LUDWIG RITTER VON HEUFLER. (Read before the Meeting of the Zoologico-Botanical Society of Vienna; May and June, 1856.)

This is a remarkable book: it contains 120 pages, all very full of matter, and all devoted to eight of the best-known plants in Europe. Nevertheless the work is systematically done, and well done in its way; and, though longer by a hundred pages than we care to see or wished to read, it is throughout so well arranged and furnished with such good tabular analyses of the author's results, that we have no difficulty in appreciating its contents and referring to them when wanted. The author attempts to exhaust the literature, structure, affinities, distribution, habitats, localities, and history of the European species of *Asplenium*, viz. *A. palmatum*, *marinum*, *viride*, *Trichomanes*, *Petrarchæ*, *Germanicum*, *Adiantum-nigrum*, and *Ruta-muraria*; and, so far as we can judge, has succeeded in his attempt perfectly well.

Though we must confess that we should have preferred seeing much of the writer's undoubted industry, knowledge, and accuracy, directed into another and wider channel, there is something singularly classical as well as able in the whole treatment of the subject; and though essentially a mass of details, the majority of which have no interest or importance *per se*, these are so skilfully arranged that the simple operation of glancing over them gives a vast deal of information on the literature of botany and *Res Botanices* of Europe, past and present. The book begins with a quotation in Latin verse from Valerius Cordus on the beatific influence of the study of Nature, and ends with two verses from the Apocryphal book of Ecclesiasticus, telling us that the works of Nature are beyond our comprehension, and that when we have concluded our study of them we may begin again,—a course which we hope Herr von Heufler will not adopt.

In the work, the first thing that strikes us is the fact that these eight

Asplenia have no less than a hundred names amongst them, one of them dating as far back as 300 B.C., viz. *Asplenium Trichomanes*, the τριχομανες of Theophrastus. Taking this venerable species as a type of the author's method of treating his subject, we have, after the name, etc., first a short diagnosis; then the synonymy, commencing with the Præ-Linnæan Theophrastus, and running through forty-five authors, with their dates, ending with Mettenius (the specific character of each being given), and occupying four full pages of forty lines each; next are quotations of twenty-four plates, beginning with Fuchs and ending with Ettingshausen's and Pokorny's nature-printed plants of Austria, followed by a list of published specimens; then comes an analysis of the forms of the species; then its dimensions, together with the angles its fronds make with the perpendicular; then follow successively its physiognomy, morphology, biology, the soil it prefers, horizontal distribution (three pages), vertical distribution, and lastly, the erroneous references and other sources of error in published books, etc. The work further contains two plates of forms of *Asplenium Adiantum-nigrum*, of spores of all the species, and a very neat Mercator's chart of the world, on which the distribution of all the species is traced.

Upon the whole this is a valuable contribution to the study of pteridology, and is evidently extremely carefully and accurately done. There is no attempt at species-making, paradox, or transcendentalism; it is strictly a scientific work throughout, and we only wish that the author would devote his energies to the elucidation of some less-known and more extensive tribes of plants.

KLINSMANN, ERNST FERDINAND; *Clavis Dilleniana ad* HORTUM ELTHAMENSEM. 4to. Dantzig, 1856.

This is a key to the modern names of all the plants described and figured in the very valuable work of Dillenius, entitled 'Horti Elthamensis Plantæ rariores:" first, according to the numbering of the plates; and secondly, in alphabetical order. It seems to be executed with much care.

Botanic Garden, Peradenia, Ceylon.

We can point to none of our Colonial Gardens where the importance of having a scientific and *well-educated head* of those gardens is more clearly shown than in the cases of Melbourne (Victoria), and Peradenia (Ceylon). We shall have occasion to speak immediately of the safe return of Dr. Müller, of the former Garden, from the perilous but most successful journey, from west to east, overland, across North Australia:—our present object is with Peradenia. The able Superintendent there, Mr. Thwaites, has recently published his 'Report on the Royal Botanic Gardens of Peradenia, from September 1855 to August 1856, inclusive.' Scientific and Economic Botany are here so happily combined that we are glad to give greater publicity to this Report by the following extracts. The concluding list of Indigenous Genera of Plants, and amount of species yet discovered, will be of special interest to the scientific botanist.

I.—GENERAL STATE OF THE GARDEN AND PREMISES.

The various buildings of the Establishment are in excellent condition, with the exception of the house occupied by the plant-collector and nurseryman, which is in a very dilapidated state. The civil engineer has however, by direction of Government, sent in an estimate for its being rebuilt. The same officer has now under repair the water-course supplying these grounds, which had become broken away in several places, so that nearly all the water escaped before flowing into these Gardens.

The new road, mentioned in my last Report as being in course of formation, is not yet completed, owing to there having been much sickness amongst the Coolies, and from other parts of the Garden requiring all the labour at my disposal. As soon as the settled dry weather sets in, I hope to get it finished without much further delay or difficulty. The rest of the drives and walks are in very good order.

II.—HORTICULTURAL DEPARTMENT.

What was mentioned in my last year's Report, with reference to Vanilla, West Indian Ginger, the new Pine-apples, and other plants, may be repeated in this, with an account of still further progress. The Vanillas, taking into consideration the small number of plants,

produced abundantly during the last year, and pods of most excellent quality: and there is promise of an equally large produce this year. This plant is attracting a good deal of attention amongst visitors to the Gardens, and I expect will be cultivated to some extent in the island before very long.

The Manilla Hemp-plants,* presented a few years ago to the Gardens, by Messrs. Wilson and Ritchie, are now beginning to produce fruit; so I hope shortly to be able to raise a large number of young plants for distribution.

Some of the Pine-apple plants, received from Kew, have, by means of offsets, been propagated to some extent; and these are now being distributed in small quantities, upon applications being made for them.

Among the most interesting additions of useful plants, made during the past year, may be mentioned the following, viz.:—

A fine healthy young plant, of the gigantic Bamboo of Burmah, received from the Botanic Garden at Calcutta: several young plants, raised from seeds, sent to me by Mr. Layard, the Government agent of Colombo, of the *Holcus saccharatus*, Lin.?, the "Sweet Reed" of South Africa, which is said to produce sugar of excellent quality, and the cultivation of which is now being tried in various parts of the world: and plants of the West Indian Calabash-tree, from fresh seeds procured for me from the West Indies by Captain Graham.

Apart from the introduction and distribution of plants of economic or commercial value, it seems to be not one of the least important advantages of these Gardens, the being the means of supplying to European and other residents, plants of an ornamental character, thereby contributing greatly to their pleasure and happiness, and consequently health. There is a very great disposition shown for the cultivation of shrubs and flowers about the residences of planters and others, and I feel it right to encourage this desirable taste as much as possible, by the introduction of plants new to the island, suitable for gardens. During the past year several such additions have been made, by means of the interchange with the Honourable Company's Botanic Garden at Calcutta, referred to in my last Report; some of them I am now able to distribute, and I shall shortly be able to send out several more.

* Living plants of this (*Musa textilis*) have just been safely received at Kew from Mr. Thwaites, together with a mature fruit, not larger than that of a small *Cardamom*.—Ed.

Plants of various kinds are now being raised from seeds received from Calcutta, Australia, and the Cape of Good Hope.

III.—MUSEUM AND ECONOMIC DEPARTMENT.

Amongst the additions recently made, I have the pleasure of mentioning a very valuble series of specimens of woods, consisting of nearly 200 correctly-named kinds, presented by Mr. Wright,* of Peradenia. This, with the collections of woods previously in the Museum, comprising the contributions of Mr. Bailey, assistant Government agent at Badulla, and of Mendis Modliar, makes the number very considerable; and I have reason to believe that a donation from another quarter will be made before very long. Mr. Samuel Jayetilleke,* Modliar of Kornegalle, has also been a contributor to the Museum during the past year.

Fibres.—In conformity with instructions from the Government, I addressed, in January last, a letter to the Honourable Francis Burke, on the subject of his machine for the preparation of fibres, informing him that Government had directed me to put myself in communication with him; and I requested him to be so obliging as to inform me whether his machines were then to be procured, and where application should be made for them: I am sorry to say that no answer has yet been received to this letter; so it is to be supposed that difficulties still exist to prevent the machine being brought into that general use in the colonies which there was every reason to believe, from reports respecting it, would be the case before this time. I cannot doubt I shall receive a reply to my letter, so soon as Mr. Burke is in a position to give me any definite useful information on the subject, and I shall then lose no time before making it known.

Museum Building.—By direction of Government, the civil engineer has prepared a plan and estimate for a separate building to be erected in these Gardens, as recommended last year by the Legislative Council, to contain the specimens of woods, fibres, oils, gums, and other articles of interest at present in the collection, together with such additions as are likely, from time to time, to be made to them. The plan provides for space in the building that will probably be sufficient for some few years, and additions could be made to it when found necessary. At

* These two gentlemen have also contributed valuable collections of Ceylon woods and fibres to the Museum of the Royal Gardens at Kew.

my suggestion too an abundance of table-room is included in the estimate, so that the building might be at once available, when handed over by the civil engineer; and as it seemed very desirable, and as no great additional expense would be rendered necessary to effect it, a building of a somewhat ornamental character is designed, which would be a pleasing rather than an unsightly object, in the conspicuous situation it ought to occupy in these beautiful grounds.

A well-arranged Museum will soon become one of the most interesting and important departments of this Establishment; and there can be no doubt that, in the course of a few years, an exceedingly valuable collection will be brought together here,—increased by contributions from native and other gentlemen. I may add that the Committee of the Kandy Agri-Horticultural Society have decided upon depositing in this new building, when erected, such objects of interest as may be placed at their disposal by exhibitors at their shows.

IV.—LIBRARY AND HERBARIUM.

During the past year many valuable books have been added to the Library, in exchange for dried specimens of plants.

The species of plants in the Herbarium have been considerably added to during the past year; and it seems probable that there still remain to be discovered many species quite new to science,—since an excursion is rarely made into the jungles by myself or the collector, that some kinds, previously unknown to us, are not met with.

In accordance with the promise made in my last, I annex to this Report a list of the genera, with the number of species in each genus, known to be indigenous to Ceylon; specimens of which are contained in the Herbarium. This list, as I then remarked, gives a very fair idea of the Flora of the island, and will, I apprehend, be of much interest, not only to many persons in the island, but to scientific men in Europe, who have generally but a very imperfect notion of the Flora of Ceylon. Such a list however, though it shows that some considerable progress has been made, is still but an unsatisfactory substitute for a detailed Flora of the island, that would contain a description of each species, and which I hope to have the opportunity and the means afforded me of publishing: but in order to accomplish such an undertaking, in a way that would be creditable to this Establishment and to myself, it would be indispensably necessary, either that I should visit Europe

myself, or should secure the co-operation of some qualified botanist in England, who would undertake to have the specimens I should send him, compared, when necessary, with authentic ones in the several large herbariums in England and the Continent. The latter alternative would be the preferable one on many accounts; and I hope I may eventually obtain such assistance. In the meantime I take care to publish in England any particularly interesting genera of plants I meet with here, which I feel tolerably certain have not been previously described by other botanists.

The draughtsmen have been unceasingly employed in making drawings; and there is a good deal of improvement shown in their style of doing so. I have written to England for information as to the easiest method of lithographing; for it has occurred to me that, when the work on the flora of the island is in progress, it would be very desirable to have lithographed representations of the more interesting plants, to illustrate it, executed by one of the draughtsmen; and if this could be done under my own inspection, it would be of considerable advantage, since greater accuracy would thereby be secured, and the expense of the work be much diminished.

Upon the present occasion I feel it is not at all necessary for me to make any apology or excuse for occupying so much of this Report with matters of merely scientific interest; for it is now pretty generally understood, amongst educated persons, how important a bearing pure science has upon even the ordinary pursuits of life. I trust however it may not give rise to an erroneous supposition, that in pursuing scientific investigation, I am on that account, in the least degree, neglecting what is of more direct and immediate advantage, and what it is more particularly my duty to attend to in the position I occupy here.

List of Natural Families and Genera of Phænogamic Plants and Ferns, showing the Number of Species, indigenous to Ceylon, *which each Genus contains, and which are in the Herbarium, or drawings of them in the Library, of the Royal Botanic Garden, Peradenia.*

RANUNCULACEÆ.	Sp.	DILLENIACEÆ.	Sp.	DILLENIACEÆ, *cont.*	Sp.
Naravelia, *DC.*	1	Delima, *L.*	1	Dillenia, *L.*	1
Clematis, *L.*	2	Tetracera, *L.*	1	MAGNOLIACEÆ.	
Thalictrum, *L.*	1	Acrotrema, *Jack*	10	Michelia, *L.*	1
Anemone, *L.*	1	Schumacheria, *Vahl*	4	SCHIZANDRACEÆ.	
Ranunculus, *L.*	2	Wormia, *Rottb.*	2	Kadsura, *Juss.*	1

	Sp.
Anonaceæ.	
Sageræa, *Dalz.*	1
Uvaria, *L.*	5
Goniothalamus, *Bl.*	6
Orophea, *Bl.*	4
Xylopia, *L.*	3
Cyathocalyx, *Champ.*	1
Artabotrys, *R. Br.*	2
Unona, *Linn.*	1
Guatteria, *Ruiz & P.*	4
Miliusa, *Lesch.*	3
Alphonsea, *H.f. & T.*	2
Polyalthia, *Bl.*	1
Myristicaceæ.	
Myristica, *L.*	4
Monimicaceæ.	
Hortonia, *R. W.*	1
Menispermaceæ.	
Coscinium, *Colebr.*	1
Tinospora, *Miers*	2
Anamirta, *Colebr.*	1
Tiliacora, *Colebr.*	1
Limacia, *Lour.*	1
Cocculus, *DC.*	1
Stephania, *Lour.*	1
Cissampelos, *L.*	1
Cyclea, *Arnott*	1
Pachygone, *Miers*	1
Berberideæ.	
Berberis, *Linn.*	1
Nymphæaceæ.	
Nymphæa, *L.*	2
Nelumbiaceæ.	
Nelumbium, *Juss.*	1
Cruciferæ.	
Cardamine, *L.*	2
Capparideæ.	
Cleome, *DC.*	3
Polanisia, *Raf.*	1
Cadaba, *Försk.*	2
Niebuhria, *DC.*	1
Capparis, *L.*	12
Cratæva, *L.*	1
Flacourtiaceæ.	
Phoberos, *Lour.*	5
Flacourtia, *Comm.*	2
Roumea, *Poit.*	1
Erythrospermum, *Lam.*	1
Pangiaceæ.	
Hydnocarpus, *Gærtn.*	3
Trichadenia, *Thw.*	1
Violaceæ.	
Viola, *L.*	2
Ionidium, *Vent.*	2
Alsodeia, *Thouars*	2

	Sp.
Droseraceæ.	
Drosera, *L.*	3
Polygaleæ.	
Salomonia, *Lour.*	1
Polygala, *Linn.*	7
Xanthophyllum, *Roxb.*	1
Pittosporeæ.	
Pittosporum, *Sol.*	2
Elatineæ.	
Bergia, *Roth*	1
Caryophyllaceæ.	
Polycarpæa, *L.*	1
Arvensia, *Camb.*	1
Drymaria, *Willd.*	1
Stellaria, *L.?*	1
Cerastium, *L.*	1
Mollugo, *L.*	6
Glinus, *Löffl.*	1
Lineæ.	
Linum, *L.*	1
Malvaceæ.	
Sida, *L.*	5
Abutilon, *Tourn.*	4
Urena, *L.*	2
Pavonia, *Cav.*	1
Abelmoschus, *Medik.*	2
Hibiscus, *Linn.*	5
Paritium, *A. Juss.*	1
Gossypium, *L.*	1
Lagunea, *Cav.*	1
Sterculiaceæ.	
Eriodendron, *DC.*	1
Salmalia, *Sch. & End.*	2
Cullenia, *Wight*	1
Isora, *Sch. & End.*	1
Heritiera, *Ait.*	1
Sterculia, *L.*	5
Sterculia, *L.?*	2
Pterygota, *Sch. & End.*	1
Byttneriaceæ.	
Guazuma, *Plum.*	1
Kleinhovia, *Linn.*	2
Waltheria, *L.*	1
Riedlia, *Vent.*	1
Pterospermum, *Schreb.*	1
Kydia, *Arn.*	2
Tiliaceæ & Elæocarpeæ	
Corchorus, *L.*	4
Triumfetta, *Plum.*	1
Grewia, *Juss.*	7
Berrya, *Roxb.*	1
Elæocarpus, *L.*	6
Monocera, *Jack*	1
(Anstrutheria, *Gard.*)	1
Hugoniaceæ.	
Hugonia, *L.*	2

	Sp.
Dipterocarpeæ.	
Dipterocarpus, *Gærtn.*	4
Doona, *Thw.*	7
Vatica, *L.*	2
Hopea, *Roxb.*	1
Vateria, *L.*	1
Isauxis, *Arn.*	2
Stemonoporus, *Thw.*	10
Monoporandra, *Thw.*	2
Ternstrœmiaceæ.	
Eurya, *Thunb.* (genus variabile) forsan	4
Gen. novum ?	1
Cleyera, *Thunb.*	2
Gordonia, *Ellis*	2
Carria, *Gardner*	1
Olacineæ.	
Opilia, *Roxb.*	1
Olax, *L.*	3
Strombosia, *Bl.*	1
(Bursinopetalum, *Wight*)	2
Apodytes, *E. Mey.*	1
Mappia, *Jacq.* (*Miers*)	1
Stemonurus, *Bl.* (*Miers*)	2
Urandra, *Thw.*	1
Cansjera, *Gmel.*	1
Aurantiaceæ.	
Atalantia, *Corr.*	1
Limonia, *L.*	2
Glycosmis, *Corr.*	3
Sclerostylis, *Bl.*	2
Bergera, *König*	1
Murraya, *König*	1
Clausena, *Burm.*	2
Micromelum, *Bl.*	1
Piptostylis, *Dalz.?*	1
Paramignya, *Wight*	4
Luvunga, *Ham.*	1
Feronia, *Corr.*	1
Ægle, *Corr.*	1
Citrus, *L.*	1
Hypericineæ.	
Hypericum, *L.*	2
Clusiaceæ.	
Garcinia, *L.*	2
Cambogia, *L.*	1
Xanthochymus, *Roxb.*	2
Terpnophyllum, *Thw.*	2
Mesua, *L.*	3
Calophyllum, *L.*	10
Kayea, *Wall.*	1
Hippocrateaceæ.	
Hippocratea, *L.*	2
Salacia, *L.*	4
Kokoona, *Thw.*	1

	Sp.
ERYTHROXYLEÆ.	
Erythroxylon, *L.*	6
MALPIGHIACEÆ.	
Hiptage, *Gærtn.*	2
SAPINDACEÆ.	
Cardiospermum, *L.*	1
Schmidelia, *L.*	5
Sapindus, *L.*	2
Moulinsia, *Camb.*	3
Cupania, *Plum.*	1
Nephelium, *L.*	4
Eccremanthus, *Thw.*	1
Schleichera, *Willd.*	1
Streptostigma, *Thw.*	1
Pteridophyllum, *Thw.*	1
Dodonæa, *Linn.*	1
Meliosma, *Bl.*	3
MELIACEÆ.	
Munronia, *Wight*	1
Azadirachta, *A. Juss.*	1
Mallea, *A. Juss.*	1
Milnea, *Roxb.*	2
Amoora, *Roxb.*	1
Hartighsea, *A. Juss.*	1
Walsura, *Roxb.*	2
Xylocarpus, *A. Juss.*	2
CEDRELACEÆ.	
Chickrassia, *A. Juss.*	1
Chloroxylon, *Dec.*	1
VITACEÆ.	
Vitis, *L.*	16
Leea, *L.*	1
GERANIACEÆ.	
Geranium, *L.*	1
BALSAMINEÆ.	
Impatiens, *L.*	27
Hydrocera, *Bl.*	1
OXALIDEÆ.	
Oxalis, *L.*	5
ZYGOPHYLLEÆ.	
Tribulus, *Tourn.*	1
XANTHOXYLEÆ.	
Xanthoxylon, *Kunth*	3
Toddalia, *Juss.*	3
Cyminosma, *Gærtn.*	1
STAPHYLEACEÆ.	
Turpinia, *Vent.*	1
SIMARUBACEÆ.	
Samadera, *Gærtn.*	1
OCHNACEÆ.	
Gomphia, *Schreb.*	1
Ochna, *Schreb.*	6
CELASTRINEÆ.	
Euonymus, *Tourn.*	3
Glyptopetalum, *Thw.*	1
Celastrus, *Kunth*	2

	Sp.
CELASTRINEÆ, *cont.*	
Catha, *Försk.*	2
Microtropis, *Wall.*	3
Pleurostylia, *W. & A.*	1
Elæodendron, *Jacq.*	1
Bhesa, *Ham.*	1
ILICINEÆ.	
Ilex, *L.*	3
RHAMNEÆ.	
Ventilago, *Gærtn.*	1
Zizyphus, *Tourn.*	5
Berchemia, *Neck.*	1
Rhamnus, *Juss.*	2
Scutia, *Comm.*	1
Colubrina, *L. C. Rich.*	1
Gouania, *Jacq.*	1
SAMYDACEÆ.	
Casearia, *Jacq.*	4
Gen. novum?	1
HOMALINEÆ.	
Blackwellia, *Comm.*	1
DATISCACEÆ.	
Tetrameles, *R. Br.*	1
CHAILLETIACEÆ.	
Chailletia, *Dec.*	2
AQUILARINEÆ.	
Gyrinopsis, *Gærtn.*	1
Drimyspermum, *Reinw.*	1
TEREBINTACEÆ.	
Odina, *Roxb.*	1
Mangifera, *L.*	1
Semecarpus, *L.*	15
Glycycarpus, *Dalz.*	1
Buchanania, *Roxb.*	1
Campnosperma, *Thw.*	1
Spondias, *L.*	1
Protium, *Burm.*	1
Canarium, *L.*	1
Scutinanthe, *Thw.*	1
CONNARACEÆ.	
Connarus, *L.*	4
LEGUMINOSÆ.	
Heylandia, *Dec.*	1
Crotalaria, *L.*	19
Rothia, *Pers.*	1
Parochetus, *Ham.*	1
Indigofera, *L.*	13
Psoralea, *L.*	1
Tephrosia, *Pers.*	7
Sesbania, *Pers.*	2
Stylosanthes, *L.*	1
Ormocarpus, *Pers.*	1
Zornia, *Gmel.*	1
Æschynomene, *L.*	2
Smithia, *Ait.*	2
Uraria, *Desv.*	1

	Sp.
LEGUMINOSÆ, *cont.*	
Alysicarpus, *Neck.*	2
Desmodium, *Dev.*	16
Dicerma, *Dec.*	2
Dumasia, *Dec.*	1
Clitorea, *L.*	1
Johnia, *W. & A.*	1
Glycine, *L.*	1
Shuteria, *W. & A.*	1
Galactia, *Br.*	1
Canavalia, *Dec.*	3
Mucuna, *Adans.*	3
Erythrina, *L.*	2
Strongylodon, *Vog.*	1
Butea, *König*	1
Phaseolus, *L.*	7
Dolichos, *L.*	2
Lablab, *Adans.*	2
Dunbaria, *W. & A.*	1
Cajanus, *Dec.*	1
Atylosia, *W. & A.*	2
Cantharospermum, *W. & A.*	2
Pseudarthria, *W. & A.*	1
Rhynchosia, *Dec.*	3
Nomismia, *W. & A.*	1
Cyanospermum, *W. & A.*	1
Flemingia, *Roxb.*	4
Pycnospora, *Br.*	1
Abrus, *L.*	2
Pterocarpus, *L.*	1
Pongamea, *Lour.*	4
Dalbergia, *L.*	5
Sophora, *L.*	2
Guilandina, *L.*	1
Cæsalpinia, *L.*	3
Cassia, *L.*	12
Jonesia, *Roxb.*	1
Humboldtia, *Vahl*	1
Tamarindus, *L.*	1
Bauhinia, *L.*	2
Cynometra, *L.*	1
Dialium, *L.*	1
Entada, *L.*	1
Adenanthera, *L.*	2
Dichrostachys, *Benth.*	1
Neptunia, *Lour.*	1
Acacia, *Willd.*	8
Pithecolobium, *Benth.*	3
Inga, *Willd.*	1
ROSACEÆ.	
Rubus, *L.*	7
Potentilla, *L.*	2
Agrimonia, *Tourn.*	1
Alchemilla, *Tourn.*	1
Poterium, *L.*	1

Genus	Sp.
ROSACEÆ, *cont.*	
Photinia, *Lindl.*	1
Pygeum, *Gærtn.*	3
COMBRETACEÆ.	
Terminalia, *L.*	3
Pentaptera, *Roxb.*	1
Conocarpus, *Gærtn.*	1
Lumnitzera, *Willd.*	1
Combretum, *Löffl.*	2
ŒNOTHEREÆ.	
Jussieua, *L.*	4
Ludwigia, *Roxb.*	5
HALORAGEÆ.	
Myriophyllum, *Wall.*	1
Serpicula, *L.*	2
Haloragis, *Forst.*	1
Trapa, *L.*	1
LYTHRARIEÆ.	
Rotala, *L.*	2
Ameletia, *Dec.*	1
Ammannia, *Houst.*	4
Pemphis, *Forst.*	1
Grislea, *Löffl.*	1
Lawsonia, *L.*	1
Lagerströmia, *L.*	1
Axinandra, *Thw.*	1
TAMARICACEÆ.	
Tamarix, *L.*	1
MELASTOMACEÆ.	
Melastoma, *L.*	1
Osbeckia, *L.*	14
Medinilla, *Gaud.*	4
Sonerila, *Roxb.*	15
Memecylon, *L.*	33
(Tetracrypta, *Gard. & Ch.*)	1
MYRTACEÆ.	
Sonneratia, *Linn. f.*	1
Myrtus, *Tourn.*	1
Eugenia, *Mich.* et aff.	43
Barringtonia, *Forsk.*	2
Careya, *Roxb.*	1
RHIZOPHOREÆ.	
Rhizophora, *Lam.*	2
Ceriops, *Arn.*	1
Bruguiera, *Lam.*	2
Carallia, *Roxb.*	4
ALANGIEÆ.	
Alangium, *Lam.*	2
NHANDIROBEÆ.	
Zanonia, *L.*	2
CUCURBITACEÆ.	
Bryonia, *L.* et aff.	13
Citrullus, *Neck.*	1
Momordica, *L.*	3
Luffa, *Tourn.*	1
CUCURBITACEÆ, *cont.*	
Cucumis, *L.*	1
Coccinea, *W. & A.*	1
Trichosanthes, *L.*	5
BEGONIACEÆ.	
Begonia, *L.*	4
PASSIFLOREÆ.	
Modecca, *L.*	2
PORTULACEÆ.	
Trianthema, *Sauv.*	2
Sesuvium, *L.*	1
Portulaca, *Tourn.*	3
CRASSULACEÆ.	
Kalanchoe, *Adan.*	1
Bryophyllum, *Salisb.*	1
CACTEÆ.	
Rhipsalis, *Gærtn.*	1
UMBELLIFERÆ.	
Hydrocotyle, *Tourn.*	4
Sanicula, *Tourn.*	1
Helosciadium, *Koch*	1
Pimpinella, *L.?*	1
Bupleurum, *Tourn.*	1
Peucedanum, *L.*	1
Heracleum, *L.*	1
SAXIFRAGEÆ.	
Vahlia, *Thunb.*	2
ARALIACEÆ.	
Hedera, *L.*	2
Paratropia, *Dec.*	3
LORANTHACEÆ.	
Viscum, *Tourn.*	5
Loranthus, *L.*	19
RUBIACEÆ.	
Coffea, *L.*	2
Ixora, *L.*	7
Ixora, *L.?*	1
Pavetta, *L.*	7
Prismatomeris, *Thw.*	1
Guettarda, *Vent.*	1
Gardenia, *Ell.*	1
Eupyrena, *W. & A.*	1
Randia, *Houst.*	1
Stylocoryne, *Cav.*	1
Griffithia, *W. & A.*	3
Discospermum, *Dalz.*	3
Gen. novum ?	2
Gen. novum ?	1
Epithinia, *Jack*	1
Wendlandia, *Benth.*	1
Canthium, *L.*	13
Mussænda, *L.*	1
Morinda, *Vaill.*	3
Nauclea, *L.*	7
Leucocodon, *Gardner*	1
Schizostigma, *Arn.*	1
RUBIACEÆ, *cont.*	
Acranthera, *Arn.*	1
Neurocalyx, *Hook.*	5
Dentella, *Forst.*	1
Hedyotis, *Lam.*	39
Ophiorrhiza, *L.*	9
Axanthes, *Bl.*	2
Lasianthus, *R. W.*	12
Geophila, *Don*	1
Psychotria, *L.*	4
Gen. novum ?	2
Grumelia, *Gærtn.*	10
Serissa, *Comm.*	2
Knoxia, *L.*	4
Spermacoce, *L.*	2
Hydrophylax, *Linn. f.*	1
Rubia, *Tourn.*	1
Galium, *L.*	1
LONICEREÆ.	
Dichilanthe, *Thw.*	1
Viburnum, *L.*	2
VALERIANEÆ.	
Valeriana, *Neck.*	1
DIPSACEÆ.	
Dipsacus, *Tourn.*	1
COMPOSITÆ.	
Vernonia, *Schreb.*	11
Decaneuron, *Dec.*	1
Elephantopus, *L.*	1
Adenostemma, *Forst.*	1
Lagenophora, *Cass.*	1
Myriactis, *Less.*	1
Solidago, *L.*	1
Sphæranthus, *Vaill.*	3
Dichrocephala, *Dec.*	2
Grangea, *Adans.*	1
Conyza, *Less.*	2
Blumea, *Dec.*	13
Epaltes, *Cass.*	1
Vicoa, *Cass.*	1
Eclipta, *L.*	1
Blainvillea, *Cass.*	1
Siegesbeckia, *L.*	1
Xanthium, *Tourn.*	1
Moonia, *Arn.*	2
Wedelia, *Jacq.*	1
Wollastonia, *Dec.*	1
Spilanthes, *Jacq.*	1
Artemisia, *L.*	1
Myriogyne, *Less.*	1
Antennaria, *R. Br.*	7
Gynura, *Cass.*	2
Emilia, *Cass.*	2
Doronicum, *L.*	3
Senecio, *Less.*	5
Nothonia, *Dec.*	1

Compositæ, *cont.*	*Sp.*
Sonchus, *L.*	1
Youngia, *Cass.*	2
Microrhynchus, *Less.*	1
Lactuca, *L.*	1
Stylidieæ.	
Stylidium, *Sw.*	1
Lobeliaceæ.	
Lobelia, *L.*	3
Campanulaceæ.	
Wahlenbergia, *Schr.*	1
Campanula, *Fchs.*	1
Goodenovieæ.	
Scævola, *L.*	2
Sphenocleaceæ.	
Sphenoclea, *Gærtn.*	1
Vaccineæ.	
Vaccinium, *L.*	1
Ericaceæ.	
Gaultheria, *Kalm*	1
Rhododendron, *L.*	1
Lentibularieæ.	
Utricularia, *L.*	12
Primulaceæ.	
Lysimachia, *L.*	2
Anagallis, *Tourn.*	1
Myrsinaceæ.	
Mæsa, *Försk.*	1
Embelia, *Burm.*	1
Myrsine, *L.*	5
Ardisia, *Sw.*	8
Ægiceraceæ.	
Ægiceras, *Gærtn.*	1
Sapotaceæ.	
Sapota, *Plum.*	1
Sideroxylon, *L.*	1
Isonandra, *Wight*	8
Bassia, *König*	11
Mimusops, *L.*	2
Ebenaceæ.	
Diospyros, *Dalz.*	21
Maba, *Forst.*	3
Holochilus, *Dalz.*	1
Symploceæ.	
Symplocos, *Jacq.*	21
Ancistrocladeæ.	
Ancistrocladus, *Wall.*	1
Oleaceæ.	
Olea, *Tourn.*	2
Notelæa, *Vent.*	1
Linociera, *Sw.*	4
Jasmineæ.	
Jasminum, *Tourn.*	5
Nyctanthes, *Juss.*	1
Apocynaceæ.	
Willughbeia, *Roxb.*	1

Apocynaceæ, *cont.*	*Sp.*
Carissa, *L.*	2
Ophioxylon, *L.*	2
Alyxia, *Br.*	1
Hunteria, *Roxb.*	2
Cerbera, *L.*	1
Ochrosia, *Juss.?*	1
Tabernæmontana, *Plum.*	1
Vallaris, *Burm.*	1
Cleghornia, *R. W.*	1
Wrightia, *R. Br.*	5
Alstonia, *R. Br.*	1
Heligme, *Bl.*	1
Chonemorpha, *G. Don*	1
Rhynchospermum, *DC.*	1
Aganosma, *G. Don*	1
Ichnocarpus, *R. Br.*	1
Cryptolepis, *R. Br.*	1
Anodendron, *DC.*	1
Ellertonia, *R. W.*	1
Asclepiadaceæ.	
Hemidesmus, *R. Br.*	1
Secamone, *R. Br.*	1
Toxocarpus, *W. A.*	2
Cynoctonum, *E. Mey.*	1
Calotropis, *R. Br.*	1
Sarcostemma, *R. Br.*	1
Oxystelma, *R. Br.*	1
Dæmia, *R. Br.*	1
Tylophora, *R. Br.*	7
Cosmostigma, *R. W.*	2
Marsdenia, *R. Br.*	1
Gymnema, *R. Br.*	8
Leptadenia, *R. Br.*	1
Dischidia, *R. Br.*	1
Hoya, *R. Br.*	2
Ceropegia, *Linn.*	4
Boucerosia, *W. & A.*	2
Loganiaceæ.	
Strychnos, *L.*	7
Fagræa, *Thunb.*	3
Gærtnera, *Lam.*	5
Gentianaceæ.	
Exacum, *L.*	8
Cicendia, *DC.*	1
Canscora, *Lam.*	3
Slevogtia, *Reich.*	1
Gentiana, *Tourn.*	1
Tripterospermum, *Bl.*	1
Ophelia, *Don*	1
Limnanthemum, *Gmel.*	4
Bignoniaceæ.	
Calosanthes, *Bl.*	1
Spathodea, *Beauv.*	1
Stereospermum, *Cham.*	1

Sesameæ.	*Sp.*
Sesamum, *L.*	1
Pedalium, *L.*	1
Cyrtandraceæ.	
Æschynanthus, *Jack*	1
Didymocarpus, *Wall.*	4
Chirita, *Ham.*	4
Klugia, *Schlecht.*	3
Epithema, *Bl.*	1
Isanthera, *Nees*	1
Championia, *Gardn.*	1
Convolvulaceæ.	
Rivea, *Chois.*	1
Argyreia, *Lour.*	11
Pharbitis, *Chois.*	1
Calonyction, *Chois.*	1
Ipomœa, *L.*	20
Aniseia, *Chois.*	1
Breweria, *R. Br.*	1
Cressa, *L.*	1
Evolvulus, *L.*	1
Cuscuta, *Tourn.*	2
Erycibe, *Roxb.*	1
Boragineæ.	
Cordia, *Plum.*	3
Ehretia, *Linn.*	2
Rhabdia, *Mart.*	1
Tournefortia, *L.*	2
Heliotropium, *Tourn.*	4
Heliophytum, *DC.*	2
Coldenia, *L.*	1
Cynoglossum, *Tourn.*	2
Trichodesma, *R. Br.*	2
Hydroleaceæ.	
Hydrolea, *L.*	1
Solanaceæ.	
Datura, *L.*	1
Physalis, *L.*	1
Solanum, *Tourn.*	14
Scrophulariaceæ.	
Celsia, *L.*	1
Pterostigma, *Benth.*	2
Limnophila, *R. Br.*	8
Herpestes, *Gærtn.*	2
Dopatrium, *Ham.*	3
Artanema, *Don*	1
Torenia, *L.*	1
Vandellia, *L.*	4
Bonnaya, *Lk.*	7
Peplidium, *Delile*	1
Microcarpæa, *R. Br.*	1
Striga, *Lour.*	4
Sopubia, *Ham.*	2
Centranthera, *R. Br.*	3
Pedicularis, *Linn.*	1

	Sp.
PODOSTEMACEÆ.	
Podostemon, *L. C. R.*	4
Dalzellia, *R. W.*	1
OROBANCHACEÆ.	
Christisonia, *R. W.*	6
Æginetia, *L.*	1
ACANTHACEÆ.	
Thunbergia, *Linn. fil.*	1
Elytraria, *Vahl*	1
Adenosma, *Nees*	2
Ebermaiera, *Nees*	1
Hygrophila, *R. Br.*	3
Gymnostachyum, *Nees*	2
Cryptophragmium, *Nees*	3
Endopogon, *Nees*	3
Stenosiphonium, *Nees*	3
Dipteracanthus, *Nees*	2
Asystasia, *Bl.*	3
Leptacanthus, *Nees*	3
Genus novum?	1
Strobilanthes, *Bl.*	14
Barleria, *L.*	8
Asteracantha, *Nees*	1
Lepidagathis, *Willd.*	5
Ætheilema, *R. Br.*	1
Blepharis, *Juss.*	1
Dilivaria, *Juss.*	1
Crossandra, *Sal.*	2
Rostellularia, *Reich.*	6
Adhatoda, *Nees*	2
Gendarussa, *Rumph.*	6
Justicia, *Nees*	1
Rhinacanthus, *Nees*	2
Eranthemum, *L.*	1
Rungia, *Nees*	9
Dicliptera, *Juss.*	2
Andrographis, *Wall.*	4
VERBENACEÆ.	
Stachytarpha, *Vahl*	1
Lippia, *L.*	1
Lantana, *L.*	1
Callicarpa, *L.*	1
Clerodendron, *L.*	7
Gmelina, *L.*	2
Vitex, *L.*	4
Avicennia, *L.*	1
Premna, *L.*	5
LABIATÆ.	
Ocimum, *L.*	3
Geniosporum, *Wall.*	3
Moschosma, *Reich.*	1
Orthosiphon, *Benth.*	1
Plectranthus, *L'Hér.*	5
Coleus, *Lour.*	9
Anisochilus, *Wall.*	1
Pogostemon, *Desf.*	4
LABIATÆ, *cont.*	
Dysophylla, *Bl.*	2
Mentha, *L.*	1
Calamintha, *Benth.*	1
Scutellaria, *L.*	5
Anisomeles, *R. Br.*	1
Leucas, *Benth.*	4
Leonotis, *Br.*	1
Teucrium, *L.*	1
PLUMBAGINEÆ.	
Plumbago, *Tourn.*	2
PLANTAGINEÆ.	
Plantago, *L.*	1
SALVADORACEÆ.	
Salvadora, *L.*	2
Monetia, *L'Hér.*	1
POLYGONEÆ.	
Polygonum, *L.*	9
NYCTAGINEÆ.	
Boerhaavia, *L.*	1
Pisonia, *Plum.*	1
AMARANTACEÆ.	
Celosia, *L.*	3
Amarantus, *L.*	2
Chamissoa, *Kunth*	3
Psilotrichum, *Bl.*	2
Ærva, *Försk.*	2
Pseudanthus, *R. W.*	1
Achyranthes, *L.*	3
Centrostachys, *Wall.*	1
Digera, *Försk.*	1
Cyathula, *Lour.*	2
Pupalia, *Juss.*	2
Alternanthera, *DC.*	1
SALSOLACEÆ.	
Salicornia, *L.*	1
Salsola, *Gærtn.*	1
Halimus, *Wallr.*	1
PHYTOLACCACEÆ.	
Gieseckia, *L.*	1
HERNANDIACEÆ.	
Hernandia, *Plum.*	1
GYROCARPEÆ.	
Gyrocarpus, *Jacq.*	1
LAURACEÆ.	
Cinnamomum, *Burm.*	5
Machilus, *Nees*	1
Cryptocarya, *R. Br.*	2
Apollonias, *Nees*	2
Tetranthera, *Jacq.*	3
Lepidadenia, *R. W.*	9
Actinodaphne, *Nees*	9
Litsæa, *Juss.*	9
Daphnidium, *Nees*	2
Cassytha, *L.*	1
SANTALACEÆ.	
Osyris, *L.*	1
Scleropyrum, *Arn.*	1
ELÆAGNEÆ.	
Elæagnus, *L.*	4
DAPHNOIDEÆ.	
Daphne, *L.*	1
Gnidia, *L.*	1
PROTEACEÆ.	
Helicia, *Lour.*	1
ARISTOLOCHIACEÆ.	
Aristolochia, *Tourn.*	2
Bragantia, *Lour.*	2
Trichopus, *Gærtn.*	1
NEPENTHACEÆ.	
Nepenthes, *L.*	1
PIPERACEÆ.	
Pothomorphe, *Miq.*	1
Piper, *L.*	5
Peperomia, *Miq.*	4
CHLORANTHEÆ.	
Sarcandra, *Gardn.*	1
EUPHORBIACEÆ.	
Euphorbia, *L.*	9
Dalichampia, *Plum.*	1
Falconeria, *Royle*	1
Excæcaria, *L.*	2
Sapium, *Jacq.?*	1
Microstachys, *A. Juss.*	1
Tragia, *Plum.*	2
Acalypha, *L.*	7
Macaranga, *Thouars*	1
Claoxylon, *A. Juss.*	2
Cleidion, *Bl.*	1
Givotia, *Griff.*	1
Elæococca, *Comm.*	3
Jatropha, *Kunth?*	1
Gelonium, *Roxb.*	2
Rottlera, *Roxb.*	8
Genus novum?	1
Trewia, *L.*	1
Adelia, *L.*	1
Croton, *L.*	8
Agrostistachys, *Dalz.*	1
Chætocarpus, *Thw.*	3
Sarcoclinium, *R. W.*	2
Mischodon, *Thw.*	1
Trigonostemon, *Bl.*	1
Briedelia, *Willd.*	3
Sauropus, *Bl.*	4
Agyneia, *L.*	1
Phyllanthus, *L.*	4
Macræa, *R. W.*	9
Reidia, *R. W.*	5
Melanthesa, *Bl.*	2
Emblica, *Gærtn.*	1

Euphorbiaceæ, *cont.*	*Sp.*
Glochidion, *Forst.*	2
Gynoon, *A. Juss.*	10
Prosorus, *Dalz.*	2
Flüggea, *Willd.*	1
Amanoa, *Aubl.*	3
Actephila, *Bl.*	3
Sphragidia, *Thw.*	1
Hemicyclia, *W. & A.*	3
Putranjiva, *Roxb.*	1
Palenga, *Thw.*	1
Goughia, *R. W.*	1
Sarcococca, *Lindl.*	1
Scepaceæ.	
Scepa, *Lindl.* et aff.	5
Antidesmeæ.	
Antidesma, *L.*	5
Phytocreneæ.	
Pyrenacantha, *Hook.*	1
Ceratophylleæ.	
Ceratophyllum, *L.*	1
Urticales.	
Celtis, *Tourn.*	2
Sponia, *Comm.*	1
Holopetala, *Planch.*	1
Helminthosperma, *Thw.*	2
Epicarpurus, *Bl.*	3
Ficus, *Tourn.*	22
Dorstenia, *Plum.*	1
Antiaris, *Lesch.*	1
Allœanthus, *Thw.*	1
Plecospermum, *Trécul*	2
Artocarpus, *L.*	2
Conocephalus, *Bl.*	1
Pouzolzia, *Gaud.*	8
Urtica, *Tourn.* et aff.	23
Balanophoreæ.	
Langsdorfia, *Mart.*	1
Cycadaceæ.	
Cycas, *Linn.*	1
Palmaceæ.	
Areca, *L.*	4
Caryota, *L.*	1
Calamus, *L.*	5
Borassus, *L.*	1
Corypha, *L.*	1
Phœnix, *L.*	2
Cocos, *L.*	1
Pandanaceæ.	
Pandanus, *L.*	3
Freycinetia, *Gaud.*	2
Nipa, *Rumph.*	1
Typhaceæ.	
Typha, *L.*	1

Pistiaceæ, *cont.*	*Sp.*
Lemna, *L.*	2
Pistia, *L.*	1
Araceæ.	
Cryptocoryne, *Fisch.*	5
Arisema, *Mart.*	2
Arum, *L.*	1
Amorphophallus, *Bl.*	1
Remusatia, *Schott.*	1
Caladium, *Vent.*	2
Orontiaceæ.	
Scindapsus, *Schott.*	2
Pothos, *L.*	2
Lasia, *Lour.*	1
Acorus, *L.*	1
Hydrocharidaceæ.	
Hydrilla, *Rich.*	1
Blyxa, *Thouars*	1
Enhalus, *L. C. Rich.*	1
Zosteraceæ.	
Posidonia, *König?*	1
Zostera, *L.?*	2
Naiadaceæ.	
Naias, *Willd.*	1
Triuridaceæ.	
Hyalisma, *Champ.*	1
Sciaphila, *Bl.*	2
Taccaceæ.	
Tacca, *Forst.*	1
Musaceæ.	
Musa, *Tourn.*	1
Zingiberaceæ.	
Zingiber, *Gærtn.*	3
Curcuma, *L.*	2
Kæmpferia, *L.*	1
Amomum, *L.*	5
Elettaria, *Rheede*	2
Geanthus, *Reinw.*	2
Hedychium, *König*	3
Alpinia, *L.*	2
Costus, *L.*	1
Marantaceæ.	
Maranta, *Plum.*	1
Phrynium, *Willd.*	2
Canna, *L.*	1
Burmanniaceæ.	
Burmannia, *L.*	4
Orchidaceæ.	
Liparis, *Rich.*	10
Oberonia, *Lindl.*	7
Microstylis, *Nutt.*	3
Dienia, *Lindl.*	1
Dendrobium, *Sw.*	13

Orchidaceæ, *cont.*	*Sp.*
Bolbophyllum, *Thouars*	1
Cirrhopetalum, *Lindl.*	5
Phreatia, *Lindl.*	2
Eria, *Lindl.*	5
Cœlogyne, *Lindl.*	2
Pholidota, *Lindl.*	1
Phaius, *Lour.*	2
Arundina, *Bl.*	1
Ipsea, *Lindl.*	1
Ania, *Lindl.*	1
Apaturia, *Lindl.*	1
Eulophia, *R. Br.*	4
Vanda, *R. Br.*	11
Saccolabium, *Lindl.*	7
Tæniophyllum, *Bl.*	1
Sarcanthus, *Lindl.*	5
Œceoclades, *Lindl.*	1
Aerides, *Lour.*	2
Thelasia, *Bl.?*	1
Podochilus, *Bl.?*	2
Acanthophippium, *Bl.*	1
Cymbidium, *Sw.*	4
Polystachya, *Hook.*	3
Calanthe, *R. Br.*	3
Geodorum, *Jacks.*	1
Satyrium, *Sw.*	1
Peristylus, *Bl.*	5
Habenaria, *Willd.*	8
Ate, *Lindl.*	1
Disperis, *Sw.*	1
Podanthera, *R. W.*	1
Cyrtosia, *Bl.*	1
Vanilla, *Sw.*	2
Zosterostylis, *Bl.*	1
Spiranthes, *L. C. Rich.*	2
Monochilus, *Bl.*	5
Goodyera, *R. Br.*	2
Genus novum	1
Anœctochilus, *Bl.*	1
Physurus, *L. C. Rich.*	1
and of genera undetermined	6
Apostasiaceæ.	
Apostasia, *Bl.*	1
Hypoxidaceæ.	
Curculigo, *Gærtn.*	1
Hypoxis, *L.*	3
Amaryllidaceæ.	
Crinum, *L.*	3
Pancratium, *L.*	2
Dioscoreæ.	
Dioscorea, *L.*	9
Smilaceæ.	
Smilax, *L.*	2

Genus	Sp.
MELANTHACEÆ.	
Disporum, *Salisb.*	1
LILIACEÆ.	
Gloriosa, *L.*	1
Sanseviera, *Thunb.*	1
Phalangium, *Juss.*	2
Dianella, *Lam.*	1
Asparagus, *L.*	4
Dracæna, *Vand.*	2
Ophiopogon, *Ait.*	1
PONTEDERACEÆ.	
Pontedera, *L.*	2
ALISMACEÆ.	
Sagittaria, *L.*	2
Damasonium, *Juss.*	1
JUNCAGINACEÆ.	
Potamogeton, *L.*	1
Aponogeton, *L.*	3
Ruppia, *L.*	1
XYRIDACEÆ.	
Xyris, *L.*	3
COMMELYNACEÆ.	
Commelyna, *Dill.*	3
Aneilema, *R. Br.*	9
Aclisia, *E. Mey.*	1
Dithyrocarpus, *R. W.*	1
Cyanotis, *Don*	6
Flagellaria, *L.*	1
JUNCACEÆ.	
Juncus, *DC.*	4
Susum, *Bl.*	1
ERIOCAULACEÆ.	
Eriocaulon, *L.*	12
CYPERACEÆ.	
Carex, *Mich.*	23
Diplacrum, *R. Br.*	1
Scleria, *Berg.*	14
Haplostylis, *Nees*	2
Lepidosperma, *Labill.*	5
Remirea, *Aub.*	1
Lepironia, *Rich.*	1
Hypolytrum, *Rich.*	5
Fuirena, *Rottb.*	7
Fimbristylis, *Vahl*	11
Isolepis, *R. Br.*	2
Trichelostylis, *Lestib.*	16
Scirpus, *L.*	6
Eleocharis, *R. Br.*	4
Cyperus, *L.*	32
Kyllingia, *L.*	4
GRAMINACEÆ.	
Leersia, *Sol.*	1
Potamochloa, *R. Br.*	1
Oryza, *L.*	1
GRAMINACEÆ, *cont.*	
Pharus, *Br.*	2
Coix, *Linn.*	1
Chionachne, *R. Br.*	1
Paspalum, *L.*	4
Paspalum, *L.?*	1
Urochloa, *Palis.*	1
Panicum, *L.*	46
Isachne, *R. Br.*	11
Oplismenus, *Palis.*	5
Setaria, *Palis.*	3
Trachyozus, *Reich.*	1
Spinifex, *L.*	1
Aristida, *L.*	4
Sporobolus, *R. Br.*	1
Polypogon, *Desf.*	1
Amphidonax, *Nees*	1
Cynodon, *Rich.*	1
Dactyloctenium, *Willd.*	1
Chloris, *Sw.*	6
Leptochloa, *Palis.*	1
Eleusine, *Gærtn.*	2
Poa, *L.*	2
Eragrostris, *Palis.*	14
Elytrophorus, *Palis.*	1
Bambusa, *Schreb.*	6
Lepturus, *R. Br.*	2
Rottbœllia, *R. Br.*	4
Manisuris, *L.*	1
Perotis, *Ait.*	1
Zoysia, *Willd.*	1
Dimeria, *R. Br.?*	5
Imperata, *Cyrill.*	1
Pogonatherum, *Palis.*	1
Erianthus, *Rich.*	1
Anthistiria, *L.*	5
Apluda, *L.*	3
Andropogon, *L.*	19
Chrysopogon, *Trin.*	3
Ischœmum, *L.*	14
and of genera undetermined	18
FILICALES.	
Ophioglossum, *L.*	2
Helminthostachys, *Klf.*	1
Botrychium, *Sw.*	1
Acrostichum, *L.*	1
Polybotrya, *H. B.*	1
Olfersia, *Radd.*	4
Stenochlæna, *J. Sm.*	1
Campium, *Presl*	1
Pœcilopteris, *Eschw.*	1
Gymnopteris, *Presl.*	5
Hemionitis, *L.*	1
Antrophyum, *Kaulf.*	1
Loxogramma, *Bl.*	1
FILICALES, *cont.*	
Leptogramma, *J. Sm.*	1
Gymnogramma, *Desv.*	1
Grammitis, *Sw.*	5
Selliguea, *Bory*	1
Stegnogramma, *Bl.*	1
Meniscium, *Schreb.*	2
Tæniopsis, *J. Sm.*	1
Monogramma, *Comm.*	1
Drymoglossum, *Pr.*	1
Polypodium, *L.*	2
Goniopteris, *Pr.*	1
Dictyopteris, *Pr.*	2
Drynaria, *Pr.*	5
Pleopeltis, *H. & B.*	1
Nipholobus, *Kaulf.*	5
Cheilanthes, *Sw.*	4
Adiantum, *L.*	7
Pteris, *L.*	11
Litobrochia, *Pr.*	3
Blechnum, *L.*	1
Lomaria, *Willd.*	1
Vittaria, *Sm.*	1
Athyrium, *Pr.*	5
Asplenium, *L.*	25
Actiniopteris, *Lk.*	1
Allantodea, *R. Br.*	1
Woodwardia, *Sm.*	1
Diplazium, *Sw.*	12
Nephrolepis, *Schott*	3
Nephrodium, *Rich.*	10
Oleandra, *Cav.*	1
Lastrea, *Presl*	26
Aspidium, *Sw.*	6
Polystichum, *Roth.*	6
Sagenia, *Pr.*	2
Lindsæa, *Dryan.*	7
Davallia, *Sm.*	13
Dicksonia, *L'Hér.*	1
Diacalpe, *Bl.*	1
Alsophila, *R. Br.*	3
Cyathea, *Sm.*	2
Ceratopteris, *Brongn.*	1
Hymenophyllum, *Sm.*	8
Trichomanes, *L.*	6
Gleichenia, *Sm.*	1
Actinostachys, *Wall.*	1
Lygodium, *Sw.*	3
Osmunda, *L.*	1
Angiopteris, *Hoffm.*	1
Marattia, *Sw.*	1
LYCOPODALES.	
Psilotum, *Sw.*	1
Lycopodium, *L.*	15
Marsilea, *L.*	2
Azolla, *Lam.*	1

TOTAL.

Dicotyledonous flowering-plants	2025
Monocotyledonous flowering-plants	644
	2669
Ferns and Lycopods	247
Species	2916

On the Properties and Uses of CRESCENTIACEÆ; *by* BERTHOLD SEEMANN, Ph. D., F.L.S.

The *Crescentiaceæ* have only so very recently been grouped together and looked upon as a connected whole, that no attempt has as yet been made to investigate their properties, or draw up an account of their uses. I wish to supply this deficiency as far as possible, by giving, in the following paragraphs, all the notes collected either during my travels, or from the various publications and unpublished memoranda that have fallen into my hands.

All *Crescentiaceæ* may be termed ornamental plants, the fine foliage, elegant flowers, and curious fruit of which have already procured for their Order a fair representation in our gardens. Several furnish excellent timber; and considerable praise is given in this respect to the *Kigelia pinnata*, De Cand., of which canoes, posts and pillars for houses, etc., are made,[1] and which, not only as an umbraculiferous, but also as a sacred tree, is held in high esteem in Africa. Kotschy, speaking of the kingdom of Nubia, says:—"On moonlight nights the negroes celebrate their religious festivals under this tree, and the *Boswellia serrata*, Roxb. As soon as the moon rises, they form circles under the oldest trees, and begin to dance, sing, and beat large drums, whilst the women supply them with the slightly intoxicating Merisa, beer made of *Sorghum*. These festivals are repeated every month, and last several nights, during which time pitchers filled with Merisa are placed around the trunks, and some of the same beverage is applied to the roots of the trees. As symbols of special veneration, high poles made of Kigelia-wood are erected before the houses of the great chiefs."[2] The genus *Crescentia* has a fruit with a hard woody shell, which in *C. Cujete*, L. (*C. cunei-*

[1] Oswald, Memor. in Mus. Kew.—H. Barth, in Bonpl., Jahrg. iv. p. 292.
[2] Kotschy in Bonpl., Jahrg. iv. p. 304.

folia, Gardn.), the Calabash-tree of the British colonists, is so large and durable that it admits of being converted into pails, bottles, pans, cups, sieves, ladles, spoons, and various other household articles.[3] In Panama I have seen milk-pans made of it, measuring thirteen inches across. Even the shell of *C. alata*, H.B.K., the Tecomate of the Mexicans, though much smaller than that of *C. Cujete*, L., is used in Mazatlan and other parts of Western Mexico for drinking-cups.[4] The shell, or rather rind, of *Kigelia pinnata*, DC., after having been hardened by drying, serves as frames for drums in Africa;[5] and it is not unlikely that the account given by the missionary Knoblecher, of the shell of a fruit found on the White Nile,[6] and devoted to the same purpose, refers to it. The fruit of the Palo de Velas, the famous Candle-tree of the Isthmus of Panama (*Parmentiera cereifera*, Seem.), has an apple-like smell, and fattens cattle,[7] whilst that of the Quaxhilote (*Parmentiera edulis*, DC.) resembling a cucumber in shape, is eaten by the Mexicans.[8] The berry of *Tanæcium lilacinum*, Seem. (*Schlegelia lilacina*, Miq.), is also edible,[9] and the sub-acid pulp of the fruit of *Crescentia Cujete*, L., affords food to the negroes.[10] Tussac believes that the fruit of *Crescentia cucurbitina*, Linn., a common seaside shrub of tropical America, contains a deadly poison, and hence he thought it necessary to warn against it by changing the specific name of the plant into that of *C. lethifera*. "I know myself," he says, "that some English soldiers in garrison at the Mirëbalis, who, having found the fruit possessed of a cucumber-like taste, boiled and eaten it, were seized with dreadful colic, and nearly all perished."[11] As this is the only instance of poisonous properties being recorded of this Order, the statement must be received with some caution: possibly some fruits of the Manchineel-tree, which generally grows in company with *C. cucurbitina*, may have been mixed with those alluded to, and caused the accident. The Galibis of Guiana extract a violet colour from the fruit of the "Emossébereoy" (*Tanæcium lilacinum*, Seem.), with which they dye their cotton

[3] Seemann, Bot. Herald, p. 183.
[4] Seemann in Hook. Journ. and Kew Misc. vol. vi. p. 276.
[5] Barth. in lit. ad auct.
[6] Kotschy in Bonpl., Jahrg. iv. p. 304.
[7] Seemann, Bot. Herald, p. 183.
[8] De Candolle, Prodr. tom. p. 244.—Lindley, Veg. Kingdom, p. 674.
[9] Seemann, Bot. Herald, p. 182.
[10] Lindley, Veg. Kingdom, p. 674.
[11] Tussac, Fl. des Antilles, tom. iv. p. 51.

cloth, their bark and straw furniture.[12] The juice of the fruit of the common Calabash-tree dyes silk black.[13] The fruit of the Coco de Mono of Topo, Venezuela (*Crescentia cucurbitina*, L.), diffuses, when ripe, an agreeable odour, which attracts monkeys, birds, and other animals partial to the fruit.[14] The medicinal properties of various species are in repute among the natives of various countries, though they have not yet been recognized in our pharmacopœias. The Philippine islanders consider a decoction of the leaves of *Crescentia alata*, H.B.K. (*C. trifolia*, Blanco), an effectual remedy for hæmoptysis.[15] The pulp of the fruit of the same species, boiled with sugar, is administered internally by the Mexicans in complaints of the chest (consumption?).[16] Half a drachm of the root of *Parmentiera edulis*, DC., to one pound of water, is considered as a remedy for dropsy in Mexico.[17] Purgative properties reside in the pulp of the *Kigelia pinnata*, DC., of which, as Ed. Vogel informs us, the Africans avail themselves;[18] they are also found in that of *Crescentia Cujete*, L., obtained in Panama by means of incision.[19] The pulp of the fruit of the last-named tree is also used internally in Mexico in inflammatory and bilious diseases,[20] and employed, like that of *Tanæcium albiflorum*, DC.,[21] in various countries as poultices. With the fruit of *Kigelia pinnata*, DC., cut in halves and slightly roasted, the natives of North-eastern Africa rub their skin, as a cure for rheumatic and syphilitic complaints.[22]

Ascent of CHIMBORAZO, *by* M. Jules Rémy, *a Frenchman, and his travelling companion, an Englishman*, Mr. Brenchley.

[The following interesting account of the ascent of Chimborazo, by two gentlemen, one of whom, M. Jules Rémy, distinguished himself previously by his travels in California, is extracted from a communication,

[12] Aublet, Guiana, tom. ii. p. 631.
[13] Seemann, Bot. Herald, p. 183.
[14] W. Birchell, Memor. in Herb. Hook.—Bonpl., Jahrg. v. p. 44.
[15] M. Blanco, Flor de Filipinas, p. 490.
[16] Seemann in Hook. Journ. and Kew Misc. vol. vi. p. 276.
[17] Heller, Reisen in Mexiko, p. 414.
[18] Ed. Vogel, Memor. in Herb. Hook.—Bonpl., Jahrg. v. p. 44.
[19] Seemann, Bot. Herald, p. 183.
[20] Heller, Reisen in Mexiko, p. 414.
[21] Lindley, Veg. Kingdom, p. 674.—Heller, Reisen in Mexiko, p. 414.
[22] Kotschy in Bonpl., Jahrg. iv. p. 304.

for which we are indebted to Alexander G. Taylor, Esq., of Monterey. —Ed.]

On the 23rd of June, 1802, the most distinguished of modern travellers, the illustrious Humboldt, accompanied by Bonpland, attempted the first ascent of Chimborazo. A peaked rock, which presented an insurmountable obstacle, forbade their progress higher than 5900 mètres (19,357 feet) on this mountain, which was then reputed as the loftiest in the world, and which still holds the first rank among the giants of the Andes. Thirty years after, December 15, 1831, M. Boussingault, who had long and scientifically explored the equatorial Cordilleras, undertook the ascent which had baffled his predecessor, proceeding by Chillapullu, which appeared to be the easier, though somewhat longer, route; but being frustrated in this direction, he made a second attempt by Humboldt's route, the Arenal. He thus attained the prodigious elevation of 6004 mètres, that is, 19,700 feet, beyond his predecessors; but, like them, he was arrested by impassable rocks.

Now it is no wonder that we lost all hope of reaching as great a height as these famous travellers; but having carefully scanned the rounded and snowy summit from Guayaquil, we could not relinquish the idea that it might yet be found accessible; and a third attempt to reach the top of Chimborazo was fixed upon therefore by Mr. Brenchley and myself.

On the 21st of July, 1856, when traversing the plateau of the Andes towards Quito, we halted at the foot of the stupendous mountain. Two days were devoted by us to studying its outline and general features, with the telescope, and to scanning every point and elevation and depression on the gigantic dome, which promised to favour our upward way. The course adopted by Humboldt and Boussingault struck us from the first as the most practicable, till arriving at the rocky barrier, quite perceptible from below, through which no issue could be descried. After we had carefully made the almost entire circuit of the colossus, we turned our steps to Quito, deferring the attempt till we should have hardened ourselves to bear the severe climate of the lofty Cordillera. We visited Pichincha, Cotopaxi, and several other giants of the Andes, and on the 2nd of November we were once more at the foot of Chimborazo, and encamped at an absolute height of 4700 mètres (15,420 feet), rather below the level of perpetual snow, in a valley situated between the Arenal and the point where the Riobamba road divides from

that to Quito. We determined to spend the day in botanizing, and in shooting deer and birds; while we should be endeavouring to decide on the track which promised easiest access to the top. We fixed ourselves in the evening under a large, sloping rock, which sheltered us from the north-east wind, but afforded no cover from wet, if the rain, which had fallen in the afternoon, should come on again. The weather cleared as night approached, and we had splendid views of the starry heavens, against which the mountain came off in strong and sharp relief, while a gurgling, subterranean stream sounded pleasantly in our ears.

At five in the morning, when it is hardly day in equinoctial regions, we left our camping-place, and started, carrying lights, two thermometers, a compass, a coffee-pot, and tobacco. The summit of Chimborazo, before us, was bearing north-east, and the Inga-Pirca stretched like a wall behind us. A steep hill, which lay between us and the perpetual snows, proved so fatiguing of ascent, with its sharp, bristling rocks, that the two natives were discouraged, and turned back again. After climbing this hill, we descended to the moist sand of a valley, which we threaded, and on emerging from it, we had the satisfaction to see the mountain-top quite free from clouds. By six o'clock we had reached the snows, and found great interest in watching the conflicts of the humming-birds, which attacked each other with their tiny beaks and buzzing wings; and no less to see a quantity of plants in flower among the eternal frosts. We noticed several *Compositæ*, and a Caryophyllaceous species: among the former were a *Culcitium* and a *Chuquiragua*, a dwarf *Umbellifera* (*Oreomyrrhis*), two kinds of Violet with tufted foliage, a starry Crucifer, and a low-growing Gentian, with large, red flowers. We were disappointed of finding *Saxifraga Boussingaulti* (of Brongniart), a plant of particular geographical interest, because it is considered to inhabit loftier spots than any known Phænogamous species.

After half an hour's walk across the snow, vegetation suddenly disappeared, and no living thing was to be seen save two large partridges, while the rocks were speckled with a few Lichens of the *Idiothalami* and *Hymenothalami* families. At this point we stopped to collect and make a faggot, which we carried on the back, of the dead branches of the *Chuquiragua;* still we had to escalade an immense rock of trachyte, from the top of which the summit of Chimborazo looked so close to us,

that we thought it could certainly be reached in half an hour. Again we came upon snow, increasingly solid, in which our feet did not sink above two inches, which proved a great assistance to us in pursuing our course up the steep incline which we were obliged to pursue, and which was so abrupt that we could not but wonder at the perpendicular distance which every step involved. No obstacle threatened to arrest us: bending sometimes a little to right, and then to left, and then making straight for the summit, we gaily pursued our way. Towards the left there certainly rose a steep escarpment of sheer, glassy ice; but as this was visible from a considerable distance, we avoided it without loss of time. Our feet and hands were bitterly cold, and we were compelled to halt now and then to get our breath, and occasionally even to sit down for a few minutes, after which we started again with new ardour. None of the peculiar sensations of sickness, distress, acute headache, and palpitations, which travellers generally experience upon lofty elevations, were felt by us; the atmospheric column was still sufficient for easy respiration, and we could not but conclude that some cause, independent of height, must be the reason for the morbid symptoms in question. It must be confessed that during the first few days of our residence at Quito we were troubled, like all new comers, with shortness of breath, but (which is a most remarkable circumstance) we lost this symptom when ascending the crater of Pichincha, which is a thousand toises (6000 feet) above the level of Quito. Perhaps the sudden changes of climate, and the fatigue inherent to mountain expeditions, have more to do with producing these discomforts than any state of atmosphere at lofty heights. Thirst we certainly experienced, and we constantly kept lumps of snow in our mouths to slake it.

Our rapid ascent had already enabled us to look above the peaks of the Cordilleras, and to descry a distance, furrowed with deep and extensive valleys, when filmy vapours, at first no thicker than spiders' webs, and clinging to the sides of the mountains, began to float away in the form of white fleeces, and, gradually collecting, to obscure from view the horizon. Suddenly, about eight o'clock, this curtain dilated, swept towards the base of Chimborazo, and in a few minutes reached the spot we had attained, becoming always denser, till it hid the summit from our eyes. Still we persisted in climbing, attracted by the hope of attaining the top, the fog thickening, till we could not see

twenty steps before us; and at half-past nine it was almost dark. As we however felt secure of being able to accomplish our return by re-tracking our own footsteps, we summoned new perseverance to our aid, and kept constantly referring to the compass, in order to avoid a precipice which we had formerly sighted. Yet a little higher and farther, and then we became sensible that the elevation was less steep, that we walked more easily, and could breathe with greater freedom, when, at intervals, hollow detonations were heard. At first we attributed them to explosions of Cotopaxi, but presently brilliant lightning announced the raging of a storm far below us,—a storm such as only equatorial regions ever know. Under the fearful impression that hail or snow would efface the prints of our steps, and thus make us lose our way (and perhaps our lives) in the attempt to descend, we decided, though regretfully, to halt; and kindling our *Chuquiragua*-wood, we began to melt some snow in our coffee-pot. At ten o'clock the thermometer, which indicated 1·7° at five feet above the snow, was immersed in boiling water, where the mercury rose to 77·5°. Our observations finished, we began to descend at a giant's pace, to regain our encampment, which we reached, in the midst of a thick fog, at about one in the afternoon. The thunder rolled without intermission, and vivid lightning-flashes, sharply defined, as we only see them in pictures, played incessantly around us till about three o'clock; an awful tempest of hail, rain, snow, and wind, rushed down upon us and our imperfectly sheltering rock, and never gave over till past midnight. We lay in a bed of water; and when daylight came we could perceive nothing but wide tracts of hail and snow, with such signs of a fresh tempest as compelled us to relinquish the thought of making another trial for the summit of Chimborazo, which we had however satisfied ourselves to be within the bounds of practicability; so we struck our tent, and hastened back to Guaranda, where we arrived late in the afternoon, the thick fog having all along intercepted the grand prospect which we longed to behold.

When we had calculated our observations, we made the unexpected and gratifying discovery that we had stood on the summit of Chimborazo, without being aware of it. From calculations and researches pursued in the Archipelago of Hawaii, and repeated upon the Cordilleras of the Equator, we had ascertained that the boiling-water point indicates a difference of 29 mètres (95·146 feet) for the tenth of a de-

gree, from which it results that, when we boiled our kettle, we had attained an elevation of 6543 mètres (21,466 feet) of perpendicular height upon Chimborazo, to which mountain Humboldt assigns an elevation of 6544 mètres (21,469 feet).

Whether our calculations be accepted as positive and undeniably correct or not, we at least ascertained the fact that the summit of Chimborazo is not inaccessible.—JULES REMY.

BOTANICAL INFORMATION.

BORNEO.

The following extract of a letter from James Motley, Esq., will be read with much interest:—

Kalanyan Banjermassing, S. Borneo, Jan. 10, 1857.

Press of business only has prevented my writing to you; for I have been at this place quite alone, except my pupil (now my assistant), Mr. Van Heckeren; and having to combine the functions of engineer, overlooker, doctor, head carpenter, and cashier, and to snatch occasional days for surveying also when I could, my hands have been pretty full of work. Mr. Wynmalen, the administrator of the Company, is now however on the spot; the doctor is also here; and I have a European assistant to superintend the carpenters and smiths; so I shall be able to go about exploring and surveying a little more, and this is not only the pleasantest part of my work, but the most productive in plants.

Before I write anything else, I must thank you for the very valuable books you have been so kind as to send me: they were a treasure indeed. Also the microscope, which Mitten has procured for me; it is a very good little instrument, and very manageable. With the Introduction to the 'Flora Indica' I was very much delighted, and above all with that most excellent chapter on *variations of species*. If a sort of Botanical Tract Society would only print it in a broad-sheet, and circulate it widely among the sect of hair-splitters, it might work some excellent conversions. It is there indeed well said, that a long course of observations in the Tropics must convince anybody of the inconvenience, almost even the absurdity, of hair-splitting. What magnificent

sport would a true species-maker find here, among the *Scitamineæ*, the smaller *Scrophularineæ*, and even the Palms! to say nothing of the Ferns. *Melastoma Malabathrica* is good, I think, for twenty species at least, and some one or two *Mephitidiæ* for nearly as many. I have, at this particular station, some beautiful opportunities of studying these variations, from the great varieties of soil, from salt-marshes, through freshwater-marshes, gravel, coal-rocks, green-stone, and metamorphosed coal-rocks, up to the great range of serpentine hills which bound our coal-field. I have particularly observed the marked effect of this last soil (serpentine) upon the colour of flowers: a very great number of plants, having red or purple flowers, become pale or white on the serpentine. This is so marked with some species that I have never seen them white on other soils or red on the serpentine. Such is the case with a little *Impatiens*, an *Ardisia*, and a minute papilionaceous plant, whose name I do not know, but of all which you will receive specimens. Of *Melastoma Malabathrica* I send you specimens, in its serpentine state; it is strangely altered, if indeed it be the same, which I believe, because I have seen some intermediate states; it is reduced from a tall shrub to what gardeners call an alpine, of five or six inches high, with smaller leaves and much larger flowers; and the fruit, instead of being purple, is greenish-yellow: you will receive specimens of it. Among the *Cruciatæ* also I believe you will find several of my plants, which belong to one species only; but I have not been very willing to admit them into my collection as yet, because I should like to have the true species *first*. I am now very fast filling up the twelfth hundred, and I hope soon to send them off to you. From No. 1000 to No. 1100 you will find imperfect, but up to 1000 the series is perfect. One or more specimens are for you, numbered to correspond with what I retain here, so that I shall be able to identify them by the numbers whenever you have time enough to give me a list of the names. The eleventh hundred I kept as a receptacle for unique or imperfect specimens, until I could get others; so, many of the numbers I cannot fill up for you at present. Of nearly all the *Orchideæ*, *Fici*, *Hoyaceæ*, and many others, you will also receive little bits in spirits.

I believe I have hit at last upon the right way of drying *succulent plants*, and such as are apt to come to pieces; and if nobody has thought of it before, it is really worth telling you. I had previously tried hot water, but that made the specimens mouldy; then a hot iron,

but that is tedious, and it spoils the flowers; pricking the leaves all over with a penknife or a fork, so as to let the water escape, is a great assistance to the drying of *Orchideæ* and *Hoyas*, but the specimens look unsightly after it; and chloride-of-calcium paper is too much trouble, except for an occasional pet specimen. I now simply put the plants into a large bottle with weak spirit for one or two nights; this effectually kills them, and an endosmosis goes on in the tissues, which breaks them up, and makes them dry almost as quickly as other plants. You will see whereabouts, in my collection, I began this system, by the much better preserved state of the *Orchideæ*.

I suppose that to have collected, in so small a space of country, nearly 1200 species, is to have been so far pretty successful; and yet I do not think I have much more than half yet, even in the region I have explored. The larger timber-trees I can get, of course, only accidentally, from time to time, the large climbers still more rarely, and the parasitical plants are hardly to be caught, except by cultivating them, which I do as far as I can. The marshes I have not half done with, and of the Salt-water Flora I have hardly one plant yet. To the mountains, properly speaking, I have only been for one or two days, and have not been much more than 1000 feet high, so there is enough still before me. What I could effect if I had nothing else to do I know not, but I believe that this island is verily the Brazil of the East. I have not found a *Rhododendron* yet; there must be some among the fine mountains I see before me where I write. I found one near Brune at about 700 feet; I think you have specimens of it; it was a weak, decumbent, radicant plant, beautiful enough, but not remarkable in its genus. *Podostemaceæ* too I have not seen, but I fancy our brooks here are hardly rocky enough: I may get some among the mountains. The *Rafflesia* eludes me, like a "Will o' the wisp;" I cannot but believe it is here, the natives have so accurately described it to me; and I have been shown three localities, all abounding in one large species of *Cissus*, but I have not yet found it. Once indeed a friend sent me what he supposed was a *Rafflesia*, but it was a great *Amorphophallus*, just as livid and as stinking as the real Simon Pure, and moreover very welcome to me, because I had not before seen it; but the *Rafflesia* remains *introuvable*.

If you have not heard of it before, it will interest you read a passage from a letter I received from Mr. Binnendijk, the sub-curator of the Buitenzorg Garden (a good friend of mine, and I believe an excellent

botanist), about the *Rafflesia Arnoldi.* It is dated August 9. "In the month of November of the past year, we have received from Bencoolen rotten female flowers of *R. Arnoldi.* I cut the flowers, and found the seeds just as Dr. Robert Brown has drawn them in his book on the female flower and fruit of *R. Arnoldi*, 1844. I put these seeds under the bark of the *Cissus scariosa*, and now we have many buds of the *Rafflesia*, I believe fifty; three of these are as large as a goose's egg, and the reticular covering is burst in such a manner that you can see the whole laciniæ of the perianthium. When we know more I shall write you. We now cultivate the *Cissus* in pots and tubs; and when they grow, we shall put the ripe seeds under the bark, and send them to Holland." This is very interesting, for if it can be done with the *Rafflesia*, it is probably practicable with the rest of the *Rhizantheæ;* and I think I remember to have heard that even the Sicilian species is not well understood.

I suppose I shall have much that is new in my Borneo collections, being nearly the first in the field; and I certainly mean you to have them first. I should be very much obliged if you could quickly send me the names, so far as possible; for I should like to send the living plants to the Gardens, and by letting the hortulanus mark off his desiderata on your list, I can do so very conveniently, and without waste of time or space. I send you drawings and descriptions, as well as I could make them, of two plants which must be new. One is probably a *Barclaya*, of which genus one only species is known, and that is not my plant. The other is an Aroideous plant; it will not come into any genus except *Cryptocoryne*, nor into that without a modification of the generic character, therefore I hope it is new.

In a walk the other day I got two very interesting plants, one an aphyllous *Burmanniacea* (*Gonyanthus*, I think, but not the one described by Blume, as this has the flowers tipped with yellow, and the root of one little egg-shaped tuber): I found very few plants, which were growing in loam on the side of a brook, in a dense wood. The other plant, which I believe is also new, was the *Kayu Oulin*, or Iron-wood (the *Balean* of Sarawak), in flower. The flowers are very curious; they seem to me something between *Myristicaceæ* and *Anonaceæ*, being trifaciate and hermaphrodite on the one hand, and on the other having a single one-seeded ovarium. Of the fruit I have seen only a decayed seed; it was a hard testa, about the size and shape of a turkey's egg,

furrowed outside like the testa of a nutmeg. What remained of the albumen was black and rotten, but appeared to have been ruminated. I send you a scrap in this letter, as I believe no botanist has seen it before, and it is one of the celebrities of Borneo. I had not time to make a drawing while fresh, and from the dried plant you can easily get a better one than I could make when you receive the specimens. The wood is perhaps the strongest in the world. I tested a piece of it, one inch square, and forty-two inches between the supports, and it bore, suspended from the centre, 338 lbs. before it gave way: its deflection was then about eight inches. I believe this is the greatest strength recorded of any wood. The wood, when fresh cut, is light-brown, but becomes of a deep reddish-black, and finally quite black when old. It is used here by the natives almost universally for boats and houses, though very heavy. It is now becoming scarce, and difficult to procure in large pieces, except from the interior of the country, where it must exist in vast forests. The trees are large and majestic, the trunk very straight, and the bark thin and scaly. This wood appears to be almost indestructible. A sort of paling or stockade which surrounds the Sultan's house at Martapora, is known by undoubted evidence to have been standing a hundred and thirty years, without even the protection of paint, and it shows no signs of decay; and the old Kraton, or palace, is still older. It is built entirely of *Oulin*, and the enormous posts and beams are all over elaborately carved, and have been formerly painted and gilt in arabesque; but this magnificent room is now neglected and disused, except on great occasions. All over the padangs or great grassy plains of this country the *Oulin* clumps stand up, white and ghastly mementos of the vast forests which once covered the whole district, and of which the oldest natives have no recollection; the stumps were there when they were young, and to all appearance will be there for a hundred years longer. In many cases they are hollow, and then a large tree has frequently grown in the centre, and by its gradual increase split the *Oulin* into three or four pieces. In some places the padangs are covered with trees, which thus look as if they grew in huge flower-pots, and whose roots squeeze themselves in strange shapes through the cracks of their ancient pedestals, which have preserved them when young from the fires which, in the dry season, sweep roaring and crackling across the padangs, destroying every living leaf.

The trees chiefly seen in the padangs are *Vitex tomentosa*, *Emblica officinalis*, and some two or three others, whose bark, being very full of sap, resists the fire for a moment or two. That is enough, for the tempest of flame, fed only by grass, is gone in an instant; and when a tree has, by one accident or another, survived three or four years, it is safe from such immediate destruction. These padang trees however, after all, are destined to perish by fire. A bit of bark is killed or knocked off: perhaps a dead stick has rested against it, and given the fire time to kill the bark; or a buffalo rubs his horn, or a pig whets his tusk there. Then the verdict has gone forth; next year the bit of bare dead surface burns long enough to kill further the edges of the wound, which is next year, and every year, more and more extended, till the tree stands up, as upon a stick, which gives way to the first storm, generally however alive to the last moment. Wherever a group of trees, other than of these few species, is seen on the padangs, it is a pretty sure sign of nearly bare rock, or gravel, too barren to carry *Alalang* (*Imperata Kœnigii*) sufficiently thick to conduct the fire. The changes in the appearance of these vast grassy plains within a few days is indeed singular. After the long dry weather they are a light greenish-yellow; the fire passes, and leaves them black; in three days more they are the lightest and freshest of green again; and in ten days after the fire they are white, as if a snowstorm had fallen upon them, with the waving plumes of flowers, which never appear except after fire, though it be delayed several years. Of course these fires destroy all that is aboveground of thousands of sapling trees, but the roots remaining alive throw up fresh shoots; these in their turn are burnt off year after year, and again, year after year, fresh shoots are thrown out from the edge of the stool, which becomes at last a thin distorted disc of wood, fixed to the ground by innumerable perpendicular fibres, and burnt perfectly smooth on the upper surface. These bare stools, sometimes eighteen inches in diameter, have a strange appearance immediately after the fire, but are soon again hidden by the grass.

When next I write to you I hope it will be to announce to you that the specimens are shipped. I enclose in this letter some seeds of the new *Barclaya;* I have coated them with gum-arabic, and perhaps they may vegetate. I hear that some seeds have lately been sent home so very successfully.

Extract of a Letter from Rev. G. Nicol, *dated* Regent, Sierra Leone, February 18, 1857.

"I have discovered a plant here, the properties of which may interest you and gentlemen of the medical profession. It is one which our people here use in the same way, and for the same purpose, as blister is used by Europeans. The effects are the same in nature, although different in degree, this being more powerful: it is a poison. The leaves, in their green state, are ground, spread upon a small piece of cloth, and applied to that part of the body which is in pain. It is kept on from five to eight minutes, not more. In fact the patient cannot endure it for a longer space: in that short time it draws wonderfully. It is extremely painful, and takes more than a week (according to the native treatment) to heal up. The beneficial effects, I understand, are great."

[The leaves above alluded to, which have been sent by our obliging correspondent, prove to be those of *Clematis grandiflora* of De Candolle, and of the Niger Flora.—Ed.]

Dried Plants of M. Huet du Pavillon.

The beautifully prepared collections of plants (alluded to in our last Number, p. 85) of M. Huet du Pavillon, made in 1856, in Sicily, Calabria, and Abruzzo, are now being distributed, all correctly named.

NOTICES OF BOOKS.

First Lessons in Botany and Vegetable Physiology (illustrated by over 360 *wood Engravings, from original drawings, by* Isaac Sprague), *to which is added a copious Glossary or Dictionary of Botanical Terms; by* Asa Gray, Fisher Professor of Natural History in Harvard University (U. S. Am.).

It is very seldom that we feel called upon to notice elementary works upon botany, nor should we do so now, did not Professor Gray's book appear on several grounds to demand something more than a passing notice. That it should prove excellent is only what every one must have expected; for Professor Gray has a thorough knowledge of his subject; he is a successful teacher, a lucid and accurate writer, and a

most careful compiler and analyst. More than all this is however necessary for the production of a good elementary work, suited both for the teacher and the pupil: the author must use language that is neither abstruse nor vague, and that is both precise and easy to be understood; he must speak with authority, but without dogmatism; must show that he can form an opinion, founded on his own independent judgment, upon doubtful matters, and that he is not indifferent to the opinions adopted by his pupils, though he must not attempt to excite a prejudice against those he himself disapproves; above all, he must avoid all appearance of evading difficulties that ought to be mastered, or glossing over false doctrines that are current in science, however high the authority that supports them.

Upon all these points Professor Gray appears to have been prepared, and we accordingly find the general character of his work to be both scientific and simple, and as perfectly suited to its object as any work of the kind we have seen.

Another claim which these 'Lessons' have upon the notice of botanists in general, arises from the circumstances under which they appear; it is the first good indigenous American work on Elementary Botany, and it is written to meet an urgent want, that, namely, of a book adapted for the use of the classes in the common and higher schools of the United States; and it is further intended to serve as a grammar of Botany and Vegetable Physiology, which shall be an introduction to Professor Gray's 'Manual of the Botany of the Northern United States.' With the 'Lessons' and the 'Manual,' a pupil of ordinary intelligence and industry may not only determine the names, affinities, and distribution of the plants of the Northern States, but obtain a very considerable experience in general botany; and when we consider that all this may be obtained for about 15*s*. (the 'Lessons' cost 1 dollar 50 cents, and the 'Manual' 2 dollars 50 cents), we affirm, without hesitation, that no country in the globe affords the means for a student's knowing the plants of his country better than the Northern United States do. This is a matter deserving very attentive consideration in our own country, where the expediency of teaching an elementary knowledge of Natural History in our schools is rapidly obtaining advocates; and at a time when it is demonstrated that science cannot be treated as a plaything, but may yet be so introduced into the school-room as to be attractive to children, and eventually a source of recreation as well as of instruc-

tion. We need hardly allude here to the eminent success which has attended the Rev. Professor Henslow's method of teaching botany to the children of day-labourers in village schools, as a proof that science not only may be, but must be, scientifically taught, if it is to be well received by children, even of our lower orders. These have understandings which, however rude and uncultivated, are by nature sharply discriminative; and they have faculties of observation, memory, and judgment, which are quickened by the study of Natural History more effectually than by any other method of training that has hitherto been adopted.

It seems rather odd, that whilst in America the elements of science have long been taught in the public schools, the means of teaching botany well is only now supplied; and it is no less singular that the converse of this state of matters should hold good in England; for here the natural sciences are almost excluded from schools, though works well (and some of them admirably) suited for such schools are not only published, but have a very large sale and wide-spread reputation. Of these none has a higher or better deserved repute than Lindley's 'School Botany.' In point of execution, this work of Lindley's and that of Professor Gray's are equal; in their applicability to their professed purposes they are also equally meritorious; in their being as well adapted to beginners of immature as of mature age, they are further strictly comparable; but in all other respects they differ widely, and both are necessary to make up the complement of elementary works.

Such a book as Lindley's 'School Botany,' which enables a beginner very rapidly to make so much sound progress as to be able, in a dozen lessons, to acquire a practical knowledge of plants, and to go on by himself in determining the affinities of plants, is not superseded by such lessons as Gray's; and on the other hand, a good book on the plan of Gray's is a desideratum in this country. Lindley's admirable 'Elements' comes nearest to it, but is not intended for the general purposes of school-teaching, and is quite unsuited to beginners; his 'Ladies' Botany,' also a very good work, and one that has done excellent service, is conducted upon a different principle; and Balfour's full and useful 'Outlines' is far too comprehensive, and better adapted to refresh the memories of those who have mastered the elements of botany, and made some progress in its details.

To the excellence of Gray's 'Manual of the Botany of the Northern United States' we have already recorded our testimony; it has no rival in any country (written in the vernacular), if we consider its merits as a scientific work, its extent, originality, and the skill and judgment displayed in the generic and specific characters, etc. Our various British Floras scarcely contain half the number of species, and display little or no originality; and it is not in the nature of things that they should do so; they have further so grown out of one another that they present little or no unity of design or purpose; and the large genera are too often treated on different principles in the same volume; in other words, they are contributed by various botanists, or founded upon their labours, though these botanists differ materially in their mode of treating genera and species.

The stride the pupil must make from Gray's 'Lessons' to his 'Manual' is however very great; and though a thorough mastery of the necessary amount of the 'Lessons' will fully qualify a student to make the best use of the 'Manual'; still he will find it very difficult to do so at first, except he has such an amount of assistance from a teacher, or such initiatory training as a book on American plants, on the plan of Lindley's 'School Botany,' would afford. By the use of the latter work the pupil is soon grounded in the fundamental principles and practice of classification, and further acquires a good elementary knowledge of some of the largest and most conspicuous Natural Orders. Why these Natural Orders should not be readily recognized by the pupil in a general work, in which they are always the most conspicuous, is not at first very obvious; but the fact is notorious to those who are engaged in teaching, that the student, in his initiatory attempts to determine the genus of a common plant, belonging to a large Natural Order, almost invariably begins by placing it in some small, obscure, or paradoxical group: it is true that failures are often useful, but there are limits beyond which they are waste of time and positive discouragements. On these accounts we consider that a work which, like Lindley's 'School Botany,' proceeding on sound principles, gives the pupil a clear and definite acquaintance with the forty or sixty most comprehensive and important Natural Orders of a country, is almost essential to the beginner who has not a tutor as well as a book.

It remains to say a few words on the plan and execution of Professor Gray's work. After a short introductory chapter on the nature and

relations of botany, the subject is commenced with the germination of a seed, and the growth of this into a plant. After the formation of the first bud, the further growth and increase from the buds into branches, with their organs, is described. This is followed by the morphology of roots, stems, and branches. Leaves are then treated of, morphologically as foliage, and according to their general and particular characters. The flower and its parts succeed; and then the fruit and seed, etc., are described. The subject of growth is then treated physiologically, and descriptions of tissue follow. Functions, chemical composition, and the flow of sap, are fully but briefly described. Plants in their relationships to one another introduce the subjects of species, genera, and higher groups, which lead on to nomenclature, methods of study, systems, and the art of collecting. A copious Glossary of about 1200 terms concludes the volume; this appears to us very full, though it contains only about 200 more terms than are defined in Linnæus's 'Fundamenta Botanica,' a remarkable proof of the comprehensive knowledge of that great naturalist, and the completeness of his mastery of the technicalities of botany, and its requirements.

The work thus constituted, barely alludes to the vast and important subject of Cryptogamic botany, which is considered, and rightly, as a separate division of the science, scarcely admitting of elementary study, as compared with Phænogamic botany, and some branches of which are further treated of in detail by Sullivant and others, in the author's 'Manual of the Botany of the Northern United States.' The whole, occupying 230 octavo pages, is divided into thirty-four lessons; and much skill and judgment is shown in making these lessons of tolerable uniformity in regard to time and matter.

The illustrations are good, as explanatory of the subjects: they amount to 360, and are said to be, almost without exception, original, and do credit to the skill and botanical accuracy of Mr. Sprague, who stands at the head of American botanical artists. Originality is not however always desirable, and we think that some of the subjects might have been advantageously copied. We cannot however too highly praise Mr. Sprague's exertions in making the illustrations, wherever possible, from American plants. In the hopes that a book, on the plan of Lindley's 'School Botany,' but founded on American plants, may soon appear in the United States, and be illustrated by the

same indefatigable artist, we would venture to hint that less shading, a more delicate outline, and a little more attention to symmetry, especially in the nervation of leaves, would improve his woodcuts very much.

As Professor Gray's work will no doubt pass through many editions, we shall shortly allude to one or two matters that have struck us as defects: thus the definitions of the two branches of botany, Physiological and Structural, given in the first lesson, are involved. According to the plan pursued, the pupil reaches his twenty-sixth lesson before he knows what a stamen is, and the twelfth before he meets with calyx and corolla. In practice such a plan could not succeed. These defects might be remedied by either of two ways: a short introductory lesson might contain a summary of the principal organs and their uses, which should at once be committed to memory as a preliminary; or the germinating seed might be traced up to the fully formed plant, with its flower and fruit, in two or three lessons, before the morphology of the root, stem, etc., were discussed. These are matters of detail, easily compensated for or adjusted in practice where the teacher is competent, which is however seldom the case in the schools of this country.

In the description of stems, those of Endogens and Exogens are loosely worded and insufficient. The direction of the woody bundles in the Endogenous stem, and the fact of their forming arcs, is of more importance than their being scattered, as distinguishing them from Exogens; for some Exogens have scattered wood-bundles, and some Endogens have these bundles arranged in concentric rings; but in no Endogen do the bundles run parallel throughout the stem, and in no Exogen do they cross one another in arcs.

The exorhizal and endorhizal germinations do not, as far as we have observed, find any place in the body of the work, nor are these terms alluded to in the Glossary. Professor Gray no doubt rightly considers that the importance of these distinctions is more apparent than real; but they should be alluded to, as should the real significance of the characters of root and seed, which they are intended to express.

In the lesson upon species and kinds, certain words are assumed to have a definite value which we are not familiar with: thus it is said that "all the descendants from the same *stock* compose one *species;*" but we have no definition of *stock* beyond this inferential one, to which many would demur. *Kind*, again, is used as synonymous with *genus*,

whereas the more popular idea considers it to be equivalent to species, as indeed the first chapter of Genesis indicates.

Lastly, the lesson upon collecting specimens and making an herbarium we should have been glad to see more full and instructive. The subject has been strangely misunderstood of late; and the collecting plants and forming an herbarium are at the present day regarded by many able speculative botanists as contemptible occupations. To point out the fallacy of such notions is not our function here; but it is of all things most important, in an elementary work, to demonstrate fully the subordination of each branch of botany. Collecting plants for the mere sake of having specimens is an unworthy pursuit, in comparison with which collecting for sale is honourable; but a collection made with the view of study, and an herbarium so arranged and kept, as to be the depository of the student's knowledge, and the materials for his further study, is of more importance than even books. To make such a collection and herbarium however requires a very careful naturalist, and in most cases a special training: the plants should be studied in their various aspects before being gathered; the specimens should be chosen with great judgment; and the herbarium should either be accompanied with, or be the key to, the botanist's notes and observations, dissections and drawings. To "know plants," in the full sense of these terms, is impossible, without a large herbarium and a large experience in collecting; and it is notorious that the love of the herbarium and its specimens amounts to a passion with some of the profoundest botanists of this century, whilst all those who have risen to eminence as botanists, in the full acceptation of the word, Linnæus, all the Jussieus, Brown, De Candolle, Lindley, Endlicher, and Asa Gray himself, founded their knowledge upon experience in the field, herbarium, and garden. Specimens and the herbarium are means, not ends; and the true botanist should have the same pride in his *hortus siccus* that the chemist has in his laboratory and preparations, the astronomer in his observatory, and the surgeon in his pathological museum. That these are Professor Gray's views we know; and in the present state of botany, in the Old World at any rate, they require being brought prominently under the notice of the student of that science at the very commencement of his studies.

Notes on some rare and little-known Plants of MADEIRA; *by* JAMES YATE JOHNSON, ESQ.

(*To the Editor of Hooker's Journal of Botany.*)

Madeira, April 6, 1857.

SIR,—I venture to ask you to allow me to announce in your pages one or two recent botanical discoveries in Madeira, and to make a few remarks on some lately published papers, which may possibly be of use to those who are desirous of completing their lists of our native plants.

In the course of last summer, Senhor J. M. Moniz (whose quick eye and persevering research Mr. Lowe has very properly commemorated) met with a tree in the north of the island, of which he showed me leaves and fruit some months afterwards. These had the appearance of belonging to *Visnea Mocanera*, L. fil., a tree which, as far as I am aware, had not previously been met with at any other place than the Canaries. In the early part of last month, Mr. N. H. Mason (who for several months past has been engaged in collecting plants in this island) sent me flowers and young fruit from the same tree; and from an examination of these I am able to say that my first conjecture was correct. Although the tree is not uncommon by the roadside in Seixal (a parish on the north coast, to which it seems to be confined), its branches are there constantly cropped for fodder; and the young leaves bear so strong a resemblance to those of *Catha cassinoides*, Webb, that it has probably been hitherto mistaken for that shrub. Under such circumstances it never puts out flowers, but on certain wild and almost inaccessible rocks it attains its full growth, and exhibits its flowers in tolerable abundance. I submitted flowers and fruit to the examination of Dr. Schacht, the eminent microscopist, of Berlin, who will doubtless hereafter publish the beautiful drawings he has made. In the meantime I may state that much light appears to have been thrown upon the true position of the tree, hitherto so much in doubt. Endlicher (Gen. Plant. p. 1018) placed it amongst *Ternstrœmiaceæ*, but afterwards he was disposed to rank it with *Ebenaceæ* (see the second Supplement to his Gen. Plant. p. 81). Mr. Webb gave a minute, and nearly accurate, account of the tree in his 'Phytographia Canariensis,' vol. ii. p. 144; and though placing it amongst *Ternstrœmiaceæ*, his remarks show that he was dissatisfied with that arrangement. Dr. Lindley also placed *Visnea* amongst

Ternstrœmiaceæ, but with a mark of doubt. A figure of the tree appeared amongst Sir William Hooker's 'Icones' (vol. iii. tab. 253), but, as I write where I cannot refer to that work, I am unable to say whether he made any remarks on its position.

The suggestion now made is that *Visnea* should take its place amongst *Ericaceæ*, in the immediate neighbourhood of *Clethra*. The chief points of resemblance between *Visnea Mocanera* and *Clethra arborea*, Ait., are these:—A persistent quinquefid calyx; a withering corolla of five segments, slightly adherent at the base; imbricated æstivation; ten stamens attached by their dilated filaments to the base of the corolla; anthers, originally four-celled, subsequently four-celled, exappendiculate, but cordate at the base, and acuminate at the apex; an ovate, hirsute, three-locular ovary, with pendulous ovules; a deeply trifid style; capsular fruit; abundant fleshy albumen surrounding the embryo; and small cotyledons with the radicle next the hilum. The structure of the wood of *Visnea* very much resembles that of *Clethra;* and it may be added that the leaves of both are alternate and exstipulate, and their peduncles bracteate. The chief points of difference between the two are that in *Visnea* the anthers dehisce longitudinally, not by pores, as in *Clethra;* the flowers are axillary and solitary, whilst in *Clethra* they are in terminal panicles; the seeds are few, not minute, and not winged, whilst in *Clethra* they are numerous, minute, and winged; lastly, the leaves of *Visnea* have a coriaceous texture, whilst those of *Clethra* are membranous.

Visnea, it may be further remarked, is another link of connection between *Ericaceæ* and *Vacciniaceæ*. The solitary axillary flowers, the attachment of the calyx to the base of the ovary, the fleshiness of the calyx, which, as the fruit ripens, enlarges, and envelopes the capsule, so as to simulate a bacca,—these are evidently points of resemblance to the *Vacciniaceæ*, over and above those possessed by *Clethra*. At the first glance, the flowers (which are white) might be mistaken for those of a *Vaccinium*.

The other additions to our Flora (less important, it is true, but still interesting) are *Lycopodium complanatum* (a plant of Middle Europe and the Azores), and *Hymenophyllum unilaterale*, Willd., both of which have been discovered by Mr. Mason on the mountains. The discovery of the latter plant reduces the number of Canarian species of Fern not found in Madeira to three, and the number of Azorean species not

found in Madeira to two. Since *Asplenium* (Allantodia) *umbrosum* has been found in the Himalayas, the number of species of Fern common and peculiar to the Canaries, Madeira, and the Azores, is reduced to two; and of these *Asplenium* (Allantodia) *axillare* forms one, the specific distinctness of which appears to be open to considerable doubt.

I will take this opportunity of mentioning, that when in England last summer, I made out, by reference to the plants in the Banksian Herbarium, that specimens of the Fern commonly known as *Nephrodium* (or Lastrea) *fœnisecii* (a Fern about which so much has been written), collected in Madeira by Masson in 1776, had been designated *Polypodium æmulum* by Dr. Solander; and upon reference to books, it appeared clear that Aiton and Willdenow had adopted Dr. Solander's name. Consequently, if priority of application is to regulate nomenclature, the name *Nephrodium* (or Lastrea) *fœnisecii* must give way to that of *Lastrea æmula.* The Fern which has been cultivated for many years by nurserymen under the erroneous name of *Aspidium* (Polystichum) *æmulum*, is the *Aspidium frondosum* of Solander and Lowe.

In Mr. Bunbury's 'List of Plants apparently peculiar to Madeira' (see his remarks on the Botany of Madeira in the first volume of the 'Journal of the Proceedings of the Linnean Society'), a list restricted to twenty-one plants out of about eighty-five, there appears *Lotus glaucus*, Sol., a plant which grows at the Azores and the Cape Verdes. In his 'List of Plants common to Madeira and the Canaries' (eighteen out of about thirty-six being given), *Laurus Canariensis*, Webb, is found, but this tree is indigenous at the Western Islands.

Turning to Mr. Lowe's recent and valuable paper ('Hooker's London Journal of Botany,' 1856, pp. 289–302), botanists may like to know, what Mr. Lowe has omitted to state, that *Pedrosia Portosanctana*, Lowe, had been previously described by Mr. Webb under the name of *Lotus Loweanus*, (Phyt. Can. vol. i. p. 87), and that *Pedrosia florida*, Lowe, agrees with *Lotus sessilifolius*, DC., as described by Mr. Webb in the same work, vol. ii. p. 85, and figured on tab. 60. The former plant appears to be peculiar to Porto Santo, whilst the latter is common to that island and Teneriffe. Thirdly, is there any valid specific distinction between Mr. Lowe's Porto-Santan *Medicago calcar* and *M. helix*, Willd., var. *β. spinosa*, Guss., a Canarian and Mediterranean plant of which Mr. Webb gathered specimens in Porto Santo, and gave

a figure in the 'Phytographia Canariensis,' tab. 55? It is certain that the absence of lateral venous reticulations on the legumes is by no means constant. Fourthly, dried plants which I have received from the Azores, marked *Lotus macranthus*, Lowe, exhibit characters so intermediate between Madeiran specimens of *Lotus macranthus* and *Pedrosia argentea*, Lowe, as to suggest the question whether we have not here a single species, different as it may look in extreme specimens.

With regard to the Campanulaceous plant named by Mr. Lowe after Mr. Wollaston, the naturalist, the genus of which was left in doubt. I may state that the ripe capsules show distinctly that Mr. Lowe's conjecture as to *Musschia* being the true genus was correct. The dehiscence is by means of transverse slits between the nerves; the capsules bear a general resemblance to those of *M. aurea*, but they have a semiglobose instead of an obconical shape; the margin of the disc is crowned with the persistent lobes of the calyx, the lobes being lanceolate, elongate, and acute. This very handsome plant is not so rare as Mr. Lowe's "rariss." might lead one to suppose. It has been met with in five of the principal ravines, and in two of them abundantly, so that it is somewhat strange it had not been previously discovered. Mr. Mason informs me that the largest specimen he has seen in his rambles was six feet high (including a flowering raceme two feet and a half long, and one foot and a half through), with leaves two feet long. The difference of habit between the two species is as striking as that of their habitats, *Musschia Wollastoni* haunting the cool, damp, shady, and elevated ravines on the northern side of the main crest of mountains, *M. aurea* flaunting on the hot and arid cliffs of the coast.

In the observations prefixed to Mr. Lowe's 'Primitiæ Faunæ et Floræ Maderæ et Portûs Sancti' (1830), he stated that *Tamnus edulis*, Lowe, had not, as far as he was able to ascertain or discover, been found wild in Madeira. I have myself however seen several plants of this species growing wild amongst the rocks, three hundred or four hundred feet above the sea, at a spot on the south coast; and a plant was shown me the other day which came from a ravine in the centre of the island. Mr. Mason informs me that he recently obtained a plant from an almost inaccessible rock in a ravine on the north-west of the island, and he has been assured of its existence in a wild state on the sea-cliffs in that part. It may therefore be noted that *Tamnus edulis* is a truly indigenous plant of Madeira.

Prunus Lusitanica, again, which Mr. Lowe has stated to be only found in gardens, is undoubtedly wild in Madeira. I have seen trees in the rocks of the Curral, and I have been informed by the peasants that there are trees growing high up amongst the mountains.

I am, Sir, your very obedient servant,
JAMES YATE JOHNSON.

Notes made during the recent Expedition across the NORTHERN PORTION *of* AUSTRALIA, *under the Command of* Mr. Surveyor Gregory; *by* DR. FR. MUELLER, Colonial Botanist of Melbourne, and Botanist to the Expedition.

Melbourne, January 14, 1857.

In the following lines I shall now endeavour to bring the principal plants, seen during our journey from the Victoria River to the Gulf of Carpentaria, and thence into the settlements, under your notice. The country up the Victoria River yielded little additional to the collection, as this was the third time I went up the River; nor did the southern part of Arrheim's Land, through which we forced our way over to the Gulf-rivers, furnish many plants not seen before: but I may mention some fine *Psoralias*, *Ventilago racemosa*, *Catha Cunninghami*, *Stylidium alsinoides*, *Lotus Australis*, *Alphitonia excelsa*, a species of *Camphoromyrtus*, *Lobelia dioica*, a stemless *Isolepis*, *Lindernia subulata*, a *Pittosporum* with small, pear-shaped fruits, two species of *Bergia* (a third occurring on Sturt's Creek), as additional plants from this part of the country. The most interesting to me was a kind of *Hydrolea*, also not unfrequent on the Gulf of Carpentaria, and one of the few plants in the discovery of which I rejoice, the addition of Natural Orders to the Australian Flora. The Stringy-bark-tree of this part of the country differs from the southern species, and although a *Eucalyptus*, it produces, *Angophora*-like, a four-toothed calyx. Several other species of this genus, all trees, were noticed, of which two are highly ornamental in producing scarlet flowers and *lamellar* bark; another in having a double operculum. I found it necessary, for the sake of satisfactory distinctions, to describe all the tropical *Eucalypti* (nearly thirty species), on the spot, and I was never at a loss how to discriminate between variety and species, by considering all the characters of the trees collectively, and by paying due attention to the soil, habit, structure, and

texture of the bark, the manner of its decortication; consulting likewise, as very important, the insertion and form of the fruit-valves, which, before opening, form either a flat or a more or less convex vertex to the capsule, a character which, beautiful as it is, can only be studied in living plants. Important also is the structure and form of the *fertile* seeds, most of the ovules becoming abortive; the former are, in many kinds, provided with a very large wing, although the seeds of the generality of the species are wingless. As precisely by the same character *Fabricia* is separated from *Leptospermum*, I do not hesitate to refer the former, as a subgenus, to the latter. Deviating here from my topic, I may mention at once a *Melaleuca*, a truly beautiful little tree, with orange flower-heads, which bears terminal, by complete concrescence, spherical fruit-heads. Little as I feel inclined to remove, upon this ground, the plant from *Melaleuca*, so little should I feel justified in removing *Syncarpia* from *Tristania*, and *Symphyomyrtus* from *Eucalyptus*, unless other differences exist of which I am not aware. I found it likewise difficult to draw a line of demarcation between the species of *Callistemon* and *Melaleuca*. Both *Vallisnerias*, a *Nelumbium*, which extends to extratropical latitudes on the Condamine River, two *Nymphæas*, two *Ouvirandras*, to which a third species was added on the east coast, a *Utricularia* with dissected leaves and the uppermost leaf-stalks enlarged into a spongy mass which assists in supporting the floating plant, a submersed *Ottelia*, a new *Potamogeton*, which differs from *P. pusillus* in producing floating leaves, were observed in the rivers and lagoons of the Gulf of Carpentaria.

One of the main branches of the Roper River having led us towards the Gulf, Mr. Gregory shaped an inland course again, in order to cross the rivers of the Gulf of Carpentaria near their sources, where the sandstone table-land was broken into deep ravines, replenished with an interesting vegetation, almost devoid of Indian forms. A new genus of *Verbenaceæ*, a *Cochlospermum*, distinct from the Victoria River species, an arborescent, charming *Calycothrix*, an *Astartea*, *Phyllanthus*, *Gompholobium*, a new genus of *Myrtaceæ*, allied to *Paryphanta* and *Tryptomene*, a *Trichinium*, *Helicteres*, *Scoparia dulcis*, *Mitrasacme*, some splendid *Hibisci*, *Mimulus Uvedaliæ*, a fine, tall *Sesbania*, used by the natives for duck-spears, a *Blumea*, *Cæsia lateriflora*, and many other plants were here the fruits of my collecting labours. On the M'Arthur River I noticed the first Cruciferous plant during the expedition,

namely *Cardamine debilis;* nor was any other found in tropical Australia, until, with many other southern plants, *Nasturtium terrestre* made, on the east coast, its appearance. *Plantagineæ*, *Epacrideæ*, *Rosaceæ*, *Ranunculaceæ*, *Tremandreæ*, *Junceæ*, *Geraniaceæ*, were likewise wanting, and *Compositæ*, *Proteaceæ*, and *Umbelliferæ* scarce, so that *Leguminosæ* retained decidedly their former preponderance. The genus *Hemicarpus* received a third species (*H. glandulosus*), well confirming the generic character, and its next relative, *Didiscus*, a new procumbent species (*D. procumbens*), at the eastern coast. Fine *Brachychiton*-trees, with *Platanus* leaves, were here and there very conspicuous in the landscape; a few small Lichens were for the first time noticed in fruit on rocks, also *Centunculus pentandrus*, a *Hydrocotyle*, an erect *Cynanchum*, *Stylidium floribundum*, a new genus of *Buettneriaceæ*, allied to *Thomasia*, *Kerandrenia anodonta*, some prickly *Solana*, various *Desmodia*, a little *Calandrinia*, several *Loranthi*, to one of which, *L. bracteatus*, already Dr. Leichhardt alluded, as being singular for the very large, leafy bracts.

Unfortunately we did not obtain on the Albert River the expected additional supplies, otherwise, no doubt, Mr. Gregory would have made another gallant dash inland, which, in all likelihood, would have disclosed new desert-plants; and thus baffled, we had now to proceed direct to the east coast. On the Albert River *Vitex trifolia* was very common, *V. acuminata* occurred likewise, also a white flowering *Sphæranthus*, and a yellow *Ipomœa; Potamogeton crispus* and *Myriophyllum verticillatum* grew in the brackish water abundantly. This river rises near the coast, and its upper branches are running throughout the year, whilst all other watercourses, with the exception of the Burdikin River, which we examined, are broken up into stagnant pools, or fine, deep reaches, and others formed only wide, sandy, dry beds, filled however, as the driftwood indicates, at certain wet years, with a vehement stream. Many of the desert-shrubs approached to the "Plains of Promise," warning us of the aridity of the interior; and indeed we had much difficulty now, at the dry season, to find a water-supply on our route to the East. Our attempt of getting in a straight line across to the Burdikin was, for want of water, frustrated, so that we were driven into the Cape York peninsula, until we reached the sandy channel of a river, perhaps the Gilbert of Dr. Leichhardt, which brought us at its sources to the dividing range between the Lynd and Burdikin. I was

not sorry for the deviation, for I ascertained here that the *Nonda* of Dr. Leichhardt is a new Chrysobalanaceous tree, and I got here also in reach of the only Gnetaceous plant hitherto found in Australia. The tract of country on the south-east side of the Gulf of Carpentaria is densely covered with an open scrub of a *Melaleuca*,* which seems to pass, in better ground, gradually into *Melaleucadendron*.

Crossing the dividing range between the waters of the Gulf of Carpentaria and those of the east coast, at the driest season, and hurried along for want of water, I was tantalized in being unable to examine thoroughly its vegetation; and unquestionably in these mountains at a later day, a productive field will yet be found for the operations of a botanist. *Xanthorrhœa*, perhaps *X. Australis*, was here seen for the first time; a curious *Jacksonia*, a splendid *Pimelea*, with long, red spikes, some *Dodonæas*, two *Bauhinias*, distinct from the north and north-western species, a *Boronia*, a *Grevillea;* and I snatched several others up when the porphyritic and granitic rocks came in contact with the sandstone.

The Burdikin furnished a large, flowering, pentaphyllous *Trichosanthes*, a second species of *Luffa*, two Meliaceous trees, with eatable fruits, an arborescent *Abrus?*, *Hakea purpurea*, a Cæsalpineous genus near to *Cassia*, with long, septate pods, and the lower stamens enlarged at the middle into a big, globular gland. But I missed, after all search, the *Lagenaria*, mentioned here by the immortal discoverer of this important river, although we saw the calabashes with the aborigines. Nor was I lucky enough to find here *Osmunda*, *Sciadophyllum*, or, on the Carpentarian Gulf, the *Eugenia*, with large fruits, discovered by my poor countryman. A narrow streamlet meanders through the broad, sandy bed of the Burdikin River, throughout the year, a charming sight to the wanderers of the desert, where we had so many a thirsty day. The vegetation shows here for the greater part but little variety, for the country along the River is an undulating pasture-land; but from the lower part of this River extends, in large tracts to the southward, that complexity of bushes and thickets, called by the settlers "Brigalow Scrub." Bad to traverse as it was for our packhorses, equally delightful were these spots to me as a botanist.

Brachychiton Delabechei, *B. populneum*, and the *Platanus*-like species from the north coast, occurred here; *Acacias* of various kinds, two

* The "Broad-leaved Tea-tree" of Dr. Leichhardt.

Geijeras, *Eremophila Mitchelli*, some *Dodonæas*, *Pholidia polyclada*, *Myoporum*, *Cassias*, amongst which the extraordinary *C. circinata*, a small Cedrelaceous tree, *Bursaria*, some Rubiaceous bushes, included in the genera *Coffea*, *Psychotria*, *Canthium*, and *Gardenia*, a *Distemma*, *Santalum lanceolatum*, a few *Melaleucas*, *Triphasia glauca*, *Scævola spinescens*, *Stenochilus longifolius*, *glaber*, and *maculatus*; a curious *Anthobolus*, very distinct from the two described species (*A. leptomeroides*), a *Plectranthus*, with exactly the smell of Cloves (*P. caryophyllatus*), *Pittosporum acacioides*, several species of *Capparis*, a new *Verbena*, several *Cissi* and *Asclepiadeæ*, form the principal constituents of the Brigalow Scrub, through which *Eucalypti* are scattered of various kinds. Your *E. populifolius* is one of the principal forest-trees of this part of the country.

Towards Peak-range we entered upon the richest basaltic plains imaginable; but unfortunately for many months in the year they are destitute of water. An abundant development of *Compositæ* was here perceptible for the first time, the yellow patches of *Brachycome chrysoglossa* being visible for long distances. *Meisneria*, *Pycnosorus*, *Ixiolæna*, *Podolepis*, *Helipterum punctatum*, *Zygophyllum apiculatum*, and many other southern plants, seem to reach here their northern boundary-line, and I have been particular in taking notice in what succession the southern plants advanced into the tropical and subtropical latitudes, many stretching as far as 18° S. *Polygonum aviculare*, *Oxalis microphylla*, *Datura Stramonium*, *Sonchus oleraceus*, *Teucrium argutum*, were the first we met, and although we passed the country only in one line, still I think that I am able to fix approximately the northern boundary of more than a hundred New South Wales species.

But it was not until we reached the Burnett, and, above all, the Brisbane River, that I could enjoy the sight and the shade of the dark forest-vegetation, which covers there in many places, hill and dale, where *Araucaria Bidwilli* and *Eutassa Cunninghami* send their lofty crowns over all other trees, and where the monotony of *Eucalyptus* gives way to the delightful shade of Sapindaceous, Meliaceous, Cedrelaceous, Celastrinious, Laurinarious, Sapotaceous, and Euphorbiaceous trees, mixed with *Acmene*, *Pittosporum*, *Eupomatia*, *Castanospermum*, etc.; numerous climbers concealing beneath them the lovely *Aneilemas*, *Ferns*, *Lobelias*, and many other tender plants, a vegetation which to picture I will not attempt. I was however so charmed with what I had seen, that after our arrival at Moreton Bay I returned with the

excellent Mr. Hill to the upper tributaries of the Brisbane and Bruck, thence over to the remarkable isolated mountains called the "Glass-houses" by the settlers. At the latter place we found chiefly Port Jackson plants, even *Tetratheca* amongst them; a new *Westringia* receiving the name *W. grandifolia;* but along the little running streamlets of the Brisbane River we had a fine harvest of noble plants, many of them already noticed before by Mr. Hill, who, with a most laudable zeal, has devoted himself to the examination of the splendid forest-vegetation that surrounds him at Moreton Bay. Amongst the plants found by him, *Grevillea Banksii, Orites excelsa, Southwellia quadrifida,* which bears beautiful *red follicles* with black seeds, a species of *Hippocratea, Calamus,* and *Pothos, Ophioglossum pendulum* (as Mr. M'Leay points out, a parasite on *Platycerium grande*), and a climbing *Peperomia,* deserve the greatest admiration. . . . . . .

During the latter period of our journey, the plants increased to such a number for the collection, that I was unable to describe from fresh specimens at all; but during the earlier part of this section of the expedition, I found, particularly on Sundays, time for writing detailed descriptions of the more interesting plants, which, as regards the gay colours of *Hibiscus*, the tender flowers of *Stylidium* or *Mitrasacme*, or the easily forgotten habitual characters of *Eucalypti*, was, I think, of some importance. Up to this time I have finished upwards of five hundred botanical descriptions. . . . .

I regret to add that many of the specimens, after being carried for such a distance by our packhorses, have suffered materially, above all by breakage; and when the rainy season set in, at our approach to the east coast, I lost many specimens, or damaged them in drying, a process which, after our long daily stages, was, in the humid evening air, not easily accomplished, particularly as we could not load our poor pack-animals in such a climate with large heavy tents, at the outset from the Victoria River. Moreover we hoped to obtain new supplies at the Albert River, so that I was unable to take more than half a ream of light paper for securing specimens. In consequence of our not meeting the schooner at the Gulf, I was, during the latter part of our expedition, seriously impeded in my operations for want of material to dry my plants; still I am glad to state that I lost no species entirely; and it is due to Mr. Gregory's wise arrangements that I succeeded in bringing my collections safely home.

Impossible as it was to remain far behind of the party, on account of the hostilities of the natives, who attacked us twice, I have not secured so many kinds of seeds as I might have wished, particularly during the latter part of the exploration, one bagfull being unfortunately lost on a very rainy day, when we broke through some dense mountain-scrub; but when I say, Sir William, that I never lost a single minute in repose or useless occupation, I trust that you will be content with the small quantity I have to offer. My time indeed was so much occupied, that I could not even write my journal at daylight, but I devoted part of my two hours' nightly watch at the bivouac-fire for the purpose.

Perhaps it may be interesting to you to picture the daily routine of our life in the field. We were roused precisely at four o'clock A.M., by the last sentry on watch, finished our simple breakfast in a quarter of an hour, went at once out in search of our horses, and managed generally to have them caught, driven in, saddled, and packed, a little past sunrise. We travelled hardly ever less than eight hours, often ten, at the rate of about three miles an hour; but when grass or water was not conveniently found, sometimes considerably longer. Unloading, going through our little domestic duties, repair of clothes and saddlery, attendance to our noble animals (without which we should have been helpless beings in the wilderness), pitching our calico sheets, and refreshing ourselves by a hasty meal, would occupy us for better than an hour; the rest of the day, about two hours at the average, was allotted to the special duties of our respective departments. I would employ myself in examining the plants around our camp, in attending to the specimens and seeds snatched up on the way, or writing botanical notes. At night we stretched ourselves on our blankets, and generally in full clothes, to be ready for defence at a second's notice, the gun alongside us, the revolver under our head.

During our journey around the southern part of the Carpentaria Gulf, the season was so dry that even that precious providential gift of nature, the Purslane, was parched and bitter. Our rations were small; the salt pork melted by the heat to a quarter of its original weight (which of course remained the standard), it became rancid and most indigestible. Game was scarcely to be had. But when we proceeded to the eastern part of the continent, rain-showers had refreshed the vegetation, and we enjoyed not only the *Portulaca* again, which was valuable above anything of the kind in being gathered without loss of time,

and being in its fresh state, at once ready for use, but we relished also occasionally the boiled *Chenopodium erosum*, which is hardly inferior to Spinach, although we could badly afford the time for collecting it.

I add yet a few more botanical notes, although I cannot at this time collect my remarks for a proper general account of the last results. *Casuarina equisetifolia* was not seen before we reached the Great Northern Gulf. Grasses became less numerous than on the Victoria River and on Sturt's Creek; and, with a few exceptions, Mosses and Lichens avoid obstinately the northern part of Australia. *Fungi* are likewise scarce. *Chenopodium auricomum* surrounds generally the water-holes, and is often consociated with *Polygonum Cunninghami*. Having added again a few species of *Crotalaria* and *Stylidium* to the collection, I shall have a fine display of these genera in my enumeration. The species of *Cissus* are also manifold. *Greevesia* extends as far as the Dawson River north. *Brasenia* has been seen only in leaves; and Mr. Hill informs me that he saw it in the Capaspe River, whence it consequently enriches my Victoria Flora with the Order of *Cabombeæ*. I know now five Menispermous plants from Australia, one certainly a *Cocculus*, another belonging to *Stephania*. To *Proteaceæ* I added as new only an arborescent *Grevillea*, with compressed filiform leaf-lobes, and an insignificant species of *Stenocarpus*, also perhaps a *Hakea*. *Grevillea gibbosa*, *G. striata*, *G. chrysodendron*, *G. ceratophylla*, and *Hakea lorea*, gain extratropical latitudes. A new *Herpestis* (*H. peplidifolia*), and a new *Tournefortia*, *Bryonia*, *Parsonsia*, and *Marsdenia*, were to me interesting.

Taking a retrospective glance over my operations, I do not think to overrate the number of distinct plants, as collected within the intratropical zone of Australia, in stating it 1500 species, of which I have reason to believe 500 are at least not yet described, although some of these beyond doubt have been seen by the venerable R. Brown and the late Allan Cunningham.

I beg to enclose in this letter a cheque of £25, praying you will be kind enough to order, through your bookseller, such works as are most essential for the further examination of the North Australian plants. I should also be very much obliged to receive one of your *simple* microscopes, as used and recommended by yourself.

I have the two first fascicles of the Tasmanian Flora before me, and am much delighted with their contents. You will allow me, by a hasty

glance through it, to make a few observations on some of the plants enumerated, to which I would be anxious to see Dr. Hooker's consideration once more directed. The views which I express I advance with diffidence; still I thought it my duty, as disciple of a science, for science' sake to express them.

Some of the seeds—in fact a great many—you sent us, have produced excellent acquisitions to our garden. I long for more. Having my hands free, I shall be able to give excellent collections for exchange. I am so anxious to stock this garden well.

FRED. MUELLER.

On the PALMITE *of* South Africa; *by* SIR W. J. HOOKER, D.C.L., F.R.A. *and* L.S.

Prionium Palmita, *E. Meyer in Linnæa*, vii. 131. *Kunth, En. Plant.* iii. 315.

Juncus serratus, *Thunb. Prodr.* 66. *Fl. Cap.* 337. *Linn. Suppl.* 208. *Willd. Sp.* 219. *Rœm. et Schul. Syst.* vii. 245.

Acorus Palmita, *Lichtenst. Reise*, ii. 256. (TAB. NOSTR. IV.)

HAB. Rapid streams in South Africa.

Ad characterem cl. Meyeri adde—*Ovula* infra medium loculi inserta; *semina* loculis solitaria, ascendentia; *testa* cellulosa, laxa; *albumen* carnosum; *embryo* axi albuminis clavatus, ejusdem longitudinis v. dimidio brevior.

There is little to add to the excellent description of E. Meyer, except that the ovules are confined to the lower half of each cell, and that only one ripens in each cell, which it fills. The testa of the seeds which we have examined (but which are not perfectly mature) is very cellular, as in other *Junceæ*, but not at all subpubescent, as described by Meyer, the appearance of pubescence being apparently due to the texture of the surface. The outer membrane is loose, but neither wrinkled nor produced at either extremity of the seed. The albumen is fleshy, and the embryo is clavate, varying in length from half as long to nearly as long as the seed itself, and is enclosed in the axis of the albumen, its extremity being close to the hilum. In the size of its embryo the genus differs remarkably from *Juncus*, and from most *Junceæ*.—*J. D. Hooker*.

Tab. IV. Portion of a panicle and a leaf, *nat. size*. Fig. 1, flower;

2, flower cut through vertically, showing three of the stamens and pistil; 3, transverse section of an ovary; 4, vertical section of ditto; 5, capsule, from which the seeds have fallen:—*magnified.*

Palmite, Palmiet, or *Palmet,* are names given to a very remarkable aquatic Juncaceous plant (*Juncus serratus,* Linn.), having tall, thick, trunk-like stems, broad, serrated, channelled leaves, from the centre of which rises the much-branched panicle of flowers, inhabiting the beds of streams and watery places in South Africa. Our attention has been lately directed to this plant, from the circumstance of our having received a living plant from Mr. Haage, of Erfurt, and its being in all the principal characters of the flowers so entirely a *Juncus,* while the habit and coarse harsh foliage very much resemble that of some Bromeliaceous plants, and the stem forms a *trunk* from five or six to ten and eleven feet long, and as thick as a man's arm! The base of the old leaves, when the epidermis and parenchyma decay, afford an abundant *coarse* and *strong* fibre, the threads held together by a kind of network (see fig. 5), and which only needs to be tied together in bundles to form good strong brushes and brooms. The remainder of the leaf abounds in more elongated, and a far more delicate thready substance; and we have no doubt the nature and value of these two kinds of fibre will be soon put to the test. In the meanwhile we have been anxious to lay before our readers such particulars of this *Rush* as we can collect.

It does not appear that the natives of South Africa make any particular use of the plant; at least I do not find that any traveller there alludes to such a fact. And it is remarkable that Thunberg, who was the first to discover and describe it, and speaks of the "*Palmiet Rivière,*" which derives its name from its abundance there, yet nowhere alludes to its peculiar character and features. For these we are indebted to the accurate Burchell ('Travels in the Interior of Southern Africa'). His first particular notice of it is at vol. i. p. 89:—"We soon afterwards crossed the *Palmiet* River, whose waters, like the great number of those which take their rise from the southern side of the great southern range of mountains, were of a brown colour, resembling coffee, but at the same time clear and wholesome. . . . The Boors believe this brownness to be caused by the great quantity of *Palmite* (Palmiet) which everywhere grows in these streams; but however much they may assist in producing this effect, they are certainly not the chief cause, since I have observed them to be thus coloured before they reach

the foot of the mountains, and far above where the *Palmite* begins to grow." And again, p. 91 :—"Most of the rivers which we passed in this excursion are choked up with the plant called *Palmiet* by the colonists, and from which this one derives its name. Some notion of the appearance of these plants may be gained by imagining a vast number of *Ananas*, or Pine-apple plants, without fruit, so thickly crowded together as to cover the sides and even the middle of the stream, standing seldom higher than three or four feet above the surface, but generally under water whenever the river swells above its ordinary height. The stems which support them are of the thickness of a man's arm, black, and of a very tough and spongy substance, generally simple, though not rarely divided into two or more branches. They rise up from the bottom, not often in an upright posture, but inclined by the force of the current. They have very much the growth of Dragon-trees (*Dracæna*), or of some Palms, from which latter resemblance they have obtained their name." And lastly, at p. 139 of the same volume: —"We approached the Berg River with some anxiety lest it should not be fordable, but found it not yet risen higher than four feet. The ford, which had rather the appearance of a lane, led us through the tall, thick *Palmite*, with which the river was in this part so choked up, that its waters seemed as if struggling to find a passage between their stems. It would be very unsafe, without great care, for a traveller to ford a river of this kind; for should he, by the force of the stream, be carried into the *Palmites*, he might find the greatest difficulty in extricating himself or his horse from amongst their entangled trunks." Should the fibre prove valuable in a commercial point of view, such rivers of South Africa would supply any amount of the plant and some benefit to the country would accrue from the riddance of such a pest to travellers.

Peculiar as this plant is in habit, it is no wonder that E. Meyer constituted a genus of it. It is his *Prionium Palmetta* (Linnæa, vol. vii. p. 131). But all authors agree that in botanical character it is in no way different from *Juncus*, save in the sessile stigmas. Brown observes of it (Prodr. p. 591), "Forsan *Junci* non legitima species, etsi ovarii loculi polyspermi, et capsula trilocularis."

On NOTOSPARTIUM, *a new genus of* LEGUMINOSÆ, *from* New Zealand; *by* J. D. HOOKER, M.D. R.N., F.L.S., etc. With a Plate. (TAB. III.)

CHAR. GEN. *Calyx* campanulatus, truncatus, breviter 5-dentatus. *Corolla* papilionacea. *Vexillum* obovato-obcordatum, ecallosum, exauriculatum. *Alæ* lineari-oblongæ, basi hinc auriculatæ, auricula incurva. *Carina* ala longior, dolabriformis, petalis hinc breviter auriculatis, auriculis rectis obtusis. *Stamen* vexillare liberum, filamento recto, cæteris alte monadelphis; antheris oblongis. *Ovarium* subsessile, lineare, in stylum incurvum secus marginem interiorem leviter ciliatum abiens. *Ovula* 8–10, 1-seriata. *Legumen* breviter stipitatum, lineare, leviter falcatum, acuminatum, compressum, subtorulosum, membranaceum, inarticulatum, indehiscens, multiloculare, septis latiusculis, marginibus ad septa emarginatis. *Semina* loculis solitaria, oblonga, estrophiolata; testa coriacea, cotyledonibus oblongo-rotundatis plano-convexis; radicula elongata, clavata, torta.—Frutex 6–20-*pedalis* Novæ-Zelandiæ, Sesbaniæ *et* Carmichaeliæ *affinis, facie et inflorescentia* Carmichaeliæ; ramis ramulisque *gracilibus, sulcatis, flagelliformibus, pendulis, ultimis compressis, hic illic remote denticulatis;* racemis *pendulis, brevibus, multifloris, e denticulis ramulorum ortis;* floribus *roseis, pedicellatis;* pedicellis *basi minute bracteatis, calycibusque basi minute bibracteolatis sericeo-pubescentibus.* (Nomen e **νοτος**, ***australis***, et **σπαρτιον**.)

1. Notospartium Carmichaeliæ, *H.f.* (TAB. III.)

HAB. Montibus insulæ mediæ Novæ-Zelandiæ ad flumen Waihopai *Dom. Munro* invenit florentem Dec. 1853, et prope Canterbury *D. Waites.*

This very remarkable plant appears to be common in some parts of the Middle Island, where it is called "Pink Broom" by the colonists. Dr. Munro says that it forms a small tree or bush, growing in sandy and rocky places, of a very beautiful appearance when in flower, and having weeping branches. Its resemblance to *Carmichaelia* is most striking in many respects, and before receiving the fruit from Mr. Waites, I had regarded it as an undetermined species of that genus. Like it, the old plants are leafless, the branchlets slender, grooved, twiggy, compressed, covered with green bark, bearing here and there small tooth-like projections, which are undeveloped bracts, and from

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Vincent Brooks imp

Notospartium Carmichaeliae, H.f.

some of these small pendulous racemes of flowers, of the aspect and form of *Carmichaelia*, but larger, are put forth; it further agrees with that genus in the general character of the calyx, petals, and stamens, but in fruit it widely differs.

Legume slender, about an inch long and one-twelfth of an inch broad, linear, compressed, with the margins somewhat indented between each cell, membranous, pale-green, almost translucent, indehiscent, with as many cells as seeds, but the pod is not articulate between the cells. *Seeds* oblong, pale-brown, with a very short funiculus; radicle twisted, club-shaped at the extremity, as long as the cotyledons.

Mr. Bentham, who has kindly examined this plant, informs me that it is nearly allied both to *Sesbania* and *Carmichaelia*, and is very important as showing the affinities of the latter genus. I may add that the form of the embryo is essentially the same in *Notospartium* and *Carmichaelia*, the radicle in the latter genus being always club-shaped, in some species folded abruptly upwards, and applied to the margins of the cotyledons, in others folded first downwards, and then upwards; it never however is twisted, as in *Notospartium*.

Plate III. Fig. 1, flower; 2, vexillum; 3, ala; 4, carina; 5, calyx and stamens; 6, ovary; 7, ripe fruit; 8, joint of ditto, opened, showing the seed; 9, embryo:—*all magnified*.

New Zealand Woods.

We are glad to find that the subject of the relative value of the woods of the islands of New Zealand, their properties, strength, durability, etc., has occupied the attention of the Governor, as appears by the following letter, published in the 'New Zealand Government Gazette,' December 24, 1856:—

Colonial Secretary's Office, Auckland, December 20th, 1856.

His Excellency the Governor directs the following Report of trials made at the Royal Mint, Sydney, of some of the woods of New Zealand, to be published for general information.

As a knowledge of the qualities of the various woods of the Colony would be productive of much public advantage, the Government of New Zealand will with much pleasure receive any information—accompanied, if possible, by specimens—relative to woods, with respect to which there may be but little or only local knowledge, with a view to

further experiments being made of their respective properties (as dyeing, tanning, etc.), as well as of their relative strength.

Specimens should, whenever possible, be of the dimensions recommended, viz. not under 5 feet 6 inches in length, by 3 × 2 inches in scantling.—By his Excellency's command, E. W. STAFFORD.

REPORT OF EXPERIMENTS ON NEW ZEALAND WOODS.

The following woods from New Zealand have been tested as to their capability of bearing pressure applied to the centre while supported at the two extremities.

NATIVE NAME.	SCIENTIFIC NAME.
No. 1. Kauri	*Dammara australis.*
2. Totara	*Podocarpus.*
3. Rata	*Metrosideros robusta.*
4. Rimu	*Dacrydium cupressinum.*
5. Hinau	*Dicera dentata.*
6. Miro	*Podocarpus ferruginea.*
7. Manuka, or Tea-tree	*Leptospermum scoparium.*
8. Mangaia	
9. Rewa-Rewa	*Knightia excelsa.*
10. Kohe-Kohe	*Laurus Kohe-Kohe.*
11. Mapau	*Suttonia australis.*
12. Tawa	*Nesodaphne Tawa.*
13. Tawiri	
14. Kahika	*Podocarpus excelsa.*
15. Towhai	*Leiospermum.*
16. Matai	*Dacrydium.*

The above woods were sent from New Zealand, having been selected and forwarded to this Colony at the request of the Governor-General, for the purpose of experiment. Of the first four on the list, three specimens were sent; of the last three, one specimen; and of the remainder, two.

The first experiment was made with a view of obtaining a rough approximation to the value of each description of wood. The second was conducted with more care. Those woods of which specimens could not be obtained of greater scantling than $\cdot 1\frac{9}{10}$ inch square were subjected in the first place to a strain of 3 cwt., applied at the centre point. After an hour the weight was removed, and the effect of the pressure on the elasticity, if any, was noted. To those woods which the first trial had indicated to be superior, an additional 28 lbs. was now ap-

plied, and to the remainder 56 lbs. At the end of the second hour the examination was repeated, and was followed by a similar addition of weight, and so on till the piece was broken.

To the specimens of larger scantling, viz. $1\frac{9}{10}$ by 3 inches, 8 cwt. was applied in the first place, and 56 lbs. added at the end of each hour.

An arrangement was made by which the amount of deflection produced by the weight applied was multiplied on a dial. By this means a difference in deflection of $\frac{1}{20}$ of an inch, or a deterioration of the elasticity to the same amount, was rendered apparent.

Attempts were made by various means to determine in each case the position of the neutral axis, but without any reliable result being obtained. In the majority of cases the neutral axis appeared to be somewhat below the centre line, and, within a confined limit as to weight applied, to be stationary. In some woods however the neutral axis was situated far above the centre. No. 5 of the Table, for instance, bent like a rope round the point when the strain was applied; the fibres on the convex side elongating with readiness. In every case the addition of weight beyond a certain point altered sensibly the position of this axis. On the whole the results obtained were so anomalous as to induce me to abandon for the present the investigation of this portion of the subject.

Of the woods tried, I consider there are but six (Nos. 3, 6, 7, 8, 9, 12, of the accompanying Table) which the experiments have shown to be eligible for the purpose of resisting cross strains. As I am unacquainted with New Zealand woods, it is possible that even some of those which these experiments have shown to possess the necessary quality may not be procurable in size or quantity sufficient for building purposes. Though those woods only which I have mentioned appear, as far as I have been able to test them, to be suitable for resisting cross strains, it is possible that some of the others may possess the property of resisting compression as well as tension in the direction of their fibres. They may, for instance, prove serviceable as piles, struts, or tie-beams; they may be able to resist the action of moisture and even of sea-water. To ascertain the latter point, I have caused to be placed in a perforated case specimens of the woods numbered 3, 4, 5, 6, 7, 8, 9, 12, 13, 15, and have had them sunk in the harbour near Fort Macquarrie.

Number of Experiment.	Name of Wood.	Dimensions in Inches. Length.	Breadth.	Depth.	Specific Gravity.	Weight which destroyed Elasticity.	Deflection by this Weight.	Breaking Weight.	Ultimate Deflection.	$S = \frac{lw.}{4\ ad^2}$	Remarks.
						cwt.	in.	cwt.	in.		
No. 1.	Kauri . . . . (*Dammara australis.*)	60	1·9	1·9	0	5	2·2	7	4·3	1715	Fibre very brittle; breaks without warning. One of the specimens flew into five pieces.
		60	1·9	1·9	777	3	1·8	$4\frac{1}{2}$	3·0	1102	
		60	1·9	3·0	571	13	1·3	15	2·0	1470	
					674 mean.					1429 mean.	
No. 2.	Totara . . . . (*Podocarpus.*)	60	1·9	1·9	634	5	2·3	$6\frac{1}{2}$	3·5	1592	Grain of wood short and coarse; wood breaks without warning. The specimens tried were fair of their kind.
		60	1·9	1·9	0	5	2·5	$5\frac{3}{4}$	3·4	1409	
		60	1·9	3·0	540	11	1·4	$12\frac{1}{2}$	2·7	1274	
					587 mean.					1425 mean.	
No. 3.	Rata . . . . (*Metrosideros robusta.*)	60	1·9	1·9	1106	$4\frac{1}{2}$	1·3	6	1·8	1470	Specimens 1 and 2 were cross-grained and broke short. No. 3 was a very good specimen; the fracture good.
		60	1·9	1·9	0	4	3	7	3·2	1715	
		60	1·9	3·0	1050	15	·75	26	2·0	2548	
					1078 mean.					1911 mean.	
No. 4.	Rimu . . . . (*Dacrydium cupressinum.*)	60	1·9	1·9	572	5	2·5	$6\frac{1}{2}$	4·4	1592	Broke very short. No grain.
		60	1·9	1·9	0	$3\frac{1}{2}$	2·2	$5\frac{1}{2}$	4·9	1347	
		60	1·9	3·0	579	13	1·1	17	2·4	1666	
					576 mean.					1535 mean.	

Number of Experiment.	Name of Wood.	Dimensions in Inches. Length.	Breadth.	Depth.	Specific Gravity.	Weight which destroyed Elasticity.	Deflection by this Weight.	Breaking Weight.	Ultimate Deflection.	$S = \frac{lw.}{4\ ad^2}$	Remarks.
						cwt.	in.	cwt.	in.		
No. 5.	Hinau	60	1·9	1·9	562	$4\frac{1}{2}$	1·6	6	4·2	1470	Both specimens good of the sort. The wood has very little power of resisting compression; and being light is probably not durable.
	(*Dicera dentata.*)	60	1·9	1·9	0	$4\frac{3}{4}$	1·5	$6\frac{1}{4}$	4·2	1531	
										1500 mean.	
No. 6.	Miro	60	1·9	1·9	957	$6\frac{1}{2}$	1·6	$7\frac{1}{2}$	1·9	1837	This is apparently a very good wood. The first specimen broke at a knot; the second was a very clean specimen. Fibre of wood good.
	(*Podocarpus ferruginea.*)	60	1·9	1·9	0	9	2·1	$12\frac{1}{4}$	3·8	3001	
										2419 mean.	
No. 7.	Manuka	60	1·9	1·9	906	7	1·6	$11\frac{1}{2}$	5·0	2817	Both specimens were clean and good. Fibre of wood good; gave good warning before breaking.
	(*Leptospermum scoparium.*)	60	1·9	1·0	0	$7\frac{1}{4}$	2·15	$9\frac{1}{4}$	3·4	2266	
										2542 mean.	
No. 8.	Mangiau	60	1·9	1·9	621	6	2·2	7	5·3	1715	Specimen good; fibre and fracture good.
		60	1·9	1·9	0	$4\frac{3}{4}$	1·7	$6\frac{1}{2}$	3·1	1592	
										1604 mean.	
No. 9.	Rewa-Rewa	60	1·9	1·9	788	$6\frac{1}{2}$	1·5	$9\frac{1}{2}$	4·1	2327	Good specimen; fibre and fracture also good; gave fair warning.
	(*Knightia excelsa.*)	60	1·9	1·9	0	$4\frac{1}{2}$	1·4	$7\frac{1}{2}$	3·0	1837	
										2082 mean.	

Number of Experiment.	Name of Wood.	Dimensions in Inches. Length.	Breadth.	Depth.	Specific Gravity.	Weight which destroyed Elasticity.	Deflection by this Weight.	Breaking Weight.	Ultimate Deflection.	$S=\frac{lw.}{4\ ad^2}$	Remarks.
						cwt.	in.	cwt.	in.		
No. 10.	Kohe-Kohe . . . . (*Laurus Kohe-Kohe.*)	60 60	1·9 1·9	1·9 1·9	678 0	$4\frac{1}{2}$ $4\frac{1}{2}$	1·4 1·5	$5\frac{1}{2}$ 6	3·5 3·	1347 1470 1408 mean.	One of these specimens was warped, and both worm-eaten; grain tolerably fair.
No. 11.	Mapau . . . . (*Suttonia australis.*)	60 60	1·9 1·9	1·9 1·9	923 0	6 $4\frac{1}{2}$	1·8 2	8 $5\frac{1}{2}$	3 3	1960 1347 1654 mean.	The second specimen was not a good one; the first was warped, but otherwise good.
No. 12.	Tawa . . . . (*Nesodaphne Tawa.*)	60 60	1·9 1·9	1·9 1·9	685 0	$7\frac{1}{2}$ $4\frac{1}{2}$	2·5 1·1	$8\frac{1}{4}$ 5	3·4 1·3	2021 1225 1623 mean.	The second piece was worm-eaten; the first was a fair specimen.
No. 13.	Tawiri	60 60	1·9 1·9	1·9 1·9	888 0	$3\frac{1}{2}$ 5	0 1·6	5 6	0 2·2	1225 1470 1347	In first trial the wood broke suddenly at a knot; second specimen cross-grained.
No. 14.	Kahika . . . . (*Podocarpus excelsa.*)	60	1·9	3·0	502	7	1·1	$9\frac{1}{2}$	0	930	Broke very short without warning.
No. 15.	Towhai . . . . (*Leiospermum.*)	60	1·9	3·0	869	14	·9	15	3·2	1470	
No. 16.	Matai . . . . (*Dacrydium.*)	60	1·9	3·0	653	16	1·6	17	1·7	1666	Specimen and fibre both good.

The value of S, that is the constant representing the strain any particular wood can bear without fracture, is calculated for each specimen. As a means for comparison it may be stated that the value of S in the following known woods has been stated by Barlow to be as follows:—

Superior English Oak	S = 2037 to 2261
Ash	2037
Elm	1031 to 1206
Birch	1820 to 2037

I have not considered it necessary to calculate in any case the value of E, that is, the constant representing the elasticity of the wood; but the results given in the accompanying Table are sufficient for this purpose, should the elasticity of any particular specimen be required.

To decide with confidence on the value of those New Zealand woods which have exhibited desirable properties, further trials would be necessary. At present I would suggest that other specimens of Nos. 3, 6, 7, 8, 9, 12, of the Table, say four of each kind, in length not under 5 feet 6 inches and 3 inches by 2 in scantling, be obtained and be submitted to further tests.

E. W. Ward, *Captain Royal Engineers.*

New Zealand Flax.

The same 'New Zealand Gazette,' mentioned at the head of our last article, announces the following judicious reward to any person or persons who should produce Flax from the *Phormium tenax*, under the following conditions:—

"NEW ZEALAND FLAX. £4000 REWARD.

"Colonial Secretary's Office, Auckland, December 20th, 1856.

"The Government of New Zealand is prepared, subject to the under-mentioned conditions, to give rewards to the amount of £4000, for the discovery of efficient means for rendering the Flax, and other fibrous plants of New Zealand, available as articles of export, viz.:—

"Two Thousand Pounds to the person who shall, by some process of his own invention, first produce from the *Phormium tenax*, or other fibrous plant indigenous to New Zealand, one hundred tons of merchandise.

"One Thousand Pounds to any person, other than the person entitled to the first reward, who shall, by some process of his own inven-

tion, next produce from the *Phormium tenax*, or other fibrous plant indigenous to New Zealand, one hundred tons of merchandise.

"One Thousand Pounds: viz.—£200 to each of the first five persons, other than those entitled to the first and second rewards, who shall by any process, whether of his own invention or not, produce from the *Phormium tenax*, or other fibrous plant indigenous to New Zealand, twenty-five tons of merchandise.

"The merchandise must be saleable as an article of export from the colony of New Zealand, and have been produced at a cost not exceeding 75 per cent. of its value at the port of entry from which it is exported; and the process used must be fully made known, with a view to the discovery being at once made available to the public.

"His Excellency the Governor of New Zealand will from time to time appoint Commissions, to consist of not less than three persons, to act at such places as circumstances may require, and each claim for reward will be referred to such Commission as may be considered the most convenient for its proper investigation. The acts of the majority will be deemed the acts of the Commission.

"Each commission shall be at liberty to adopt such means as it may deem most fit for determining the value and cost of production of the merchandise, for ascertaining the process employed, and for fully investigating in all respects and reporting upon the validity of any claim.

"Every claim for reward must be preferred in writing before the 1st January, 1859, to the principal officer of Customs at the port of entry nearest to the place where it is desired that the examination of the merchandise shall take place, who will at once proceed to ascertain whether the full quantity in respect of which the reward is claimed is ready for examination; and if such quantity is ready, he will give a certificate to that effect, dated on the day on which he shall have ascertained the fact, and such day shall be deemed to be the day on which the merchandise was produced.

"Whenever any officer of Customs is required to go more than three miles from his residence, his travelling expenses must be paid beforehand by the person requiring his attendance, and he cannot be required to attend a second time if the quantity was found deficient on the first occasion.

"One-half of any reward will be paid at once to any person whom a Commission shall report, and the Governor shall have determined to

be entitled to the same,—after which no other claim to the same reward will be entertained,—and the other half upon satisfactory proof being given to the Governor of the *boná fide* sale of the merchandise in Europe, at an advance of not less than 20 per cent. upon the *boná fide* actual cost of the article landed in Europe.—By his Excellency's command,
E. W. STAFFORD.

BOTANICAL INFORMATION.

Accomplishment of the OVERLAND JOURNEY *across* NORTH AUSTRALIA, *from the entrance of the* Victoria River (N. W. Australia) *to* Brisbane, on the East Coast.

Of this remarkable journey, so happily accomplished under the able command of Mr. Surveyor Gregory, some notes, chiefly relating to the Vegetation of the early portion of it, are given, with the approbation of Mr. Gregory, from the pen of Dr. Mueller, Government Botanist to the Expedition, at page 321 and following pages of our last volume (vol. viii. for 1856). The letter containing that information was dated "Main Camp, on the Victoria River, June 18, 1856," just after the return of the party from that arduous excursion to the interior, as far as lat. 20° 15′ S. and long. 127° 45′, where the desert, the Salt Lake, and the utter absence of fresh-water, compelled the return to the Main Camp. Our present and some succeeding numbers of this Miscellany will be found to be in part occupied by further information of the same nature, from Dr. Mueller, collected during the rest of this remarkable journey.

In the meanwhile a brief notice of that route may not be unacceptable to our readers. What follows is an extract, with the permission of the Colonial Office, from a letter written by one of the party, Mr. Elsley, to his father, J. R. Elsley, Esq., of the Bank of England, and which, being the earliest authentic document received, that gentleman transmitted to the Right Honourable Mr. Secretary Labouchere.

It is dated, at least the first part of it, "Rennes, Dawson River, lat. 24° S., long. 150°, November 25, 1856." Mr. Elsley states that his previous letter to his father was dated June 1856 (same date as that of Dr. Mueller above alluded to), when on the eve of starting, one of

seven, with Mr. Gregory, to the Albert River, Gulf of Carpentaria, while the rest of the officers of the Expedition were despatched by sea, in the 'Tom Tough,' the tender of the Expedition, calling at Timor for supplies, and to leave letters. If this party did not meet the vessel at the place appointed (mouth of the Albert), they were prepared to push on eastwards for the settled districts, having with them thirty-two horses and two foals;—the latter "for beef" in case of emergency.

They started on June 24; travelled up the Victoria to an east creek, which was followed up in an east-north-east direction fifty or sixty miles. Thence on a table-land, not lofty, reached the heads of streams running first north, then north-west to the S. Alligator. Proceeded till they attained a creek running to Roper River of Leichhardt; then parallel to the shores of the Gulf they traversed the heads of rivers flowing into the Gulf,—the Wickham, etc. Travelled eighty miles from the coast along the edge of a table-land, from which these rivers descended. Such rivers were mostly dry, and their course through a wretched, scrubby, sandy country. Water was most providentially found during the route where they encamped at night. Vegetation, miserable Acacia and Gum scrub, without grass of any kind.

August 19.—Attained the edge of a tract marked on the map "uninterrupted scrub and Tea-tree." Seeing a fine valley from a ridge to the south, Mr. Gregory made a bold push for it, and most fortunately struck the head of Nicholson River, which had a fine supply of water. Left the bad country and came down to the Gulf, and reached Beames' Brook, which was easily crossed with the horses, ninety miles from the sea. Arrived on the appointed spot on Albert River, August 30th; but the 'Tom Tough' had not been; but the 'Torch,' a Sydney Government steamer, had. Various indications of her visit were left, but no letters were found. Stayed till December 3. Left letters buried, addressed to Mr. Baines, and directed him, if he came, to wait till October, in case Mr. Gregory's party should find it necessary to return.

September 3.—Started for the settled districts eastward, about 1200 miles:—the map of this is however wretchedly imperfect; rivers confused and misnamed. Attempted to cross from the Flinders River, due east, to the Lynd. Driven back for want of water. The country flat and dry. Compelled to go north to the "Gilbert," which has a south-east course parallel to the Lynd, nearly in lat. 18° S., and then ran

into the dividing range. Got across (the Lynd) on the 12th, and on to the Burdekin, a fine running stream; hence rapidly and continuously travelling, on an average, eight hours a day for six days in the week, always resting on Sundays. Horses in excellent condition. Reached the "Sutor;" crossed; on to the "Belyndo," and straight down the "Mackenzie," past "Peak Range," and there found tracks of white men on trees, etc., and especially found a tree marked by Leichhardt "D.I.G. ↓ L." This spot had long previously been searched, and nothing was now found but a number of bones of goats, which Leichhardt was known to have had with him. Next day came upon a plain covered with cattle- and horse-tracks, and two days after (November 21) on to the Dawson River, along which was a beaten track, evidently near some station. Camped on the banks of the river, and soon after were surprised by a mob of horses neighing up to them.

November 22.—Came to a dray-track, and soon after to a station, Mr. O'Conner's, by whom the party was well received; but they had not been expected for some months to come. This journey was made in five months and two days, whereas it took Leichhardt fifteen months to accomplish the same distance. Remained the Sunday; started on Monday for the next station, Mr. Hay's, one of the largest of the northern squatters, where we arrived the day of the date of this letter. Now open road to Moreton Bay.

To this was added, before posting the letter, a P.S.:—"December 4, 1856, River Burnett, Parkin's Station, lat. 25° 40′. Steadily progressing towards Brisbane; passing from one station to another. Letter despatched from Gayndak, post-town of the Burnett district. Reports of the party having been in a very disabled condition have been circulated."

A few Notes relating to the Vegetation of South Africa; *communicated by* Dr. W. Guyton Atherstone, *of* Graham's Town.

Graham's Town, South Africa, March 4th, 1856.

Dear Sir William,—I take advantage of one of my patients' (Rev. W. Shepstone, Wesleyan missionary) return to England to send you a small collection of plants from the neighbourhood of the great Lake Ngami, and the rivers to the northward, collected for me by Mr. Joseph M'Cabe, an enterprising traveller, who has penetrated further to the north than any other traveller except Dr. Livingstone, having gone be-

yond the Chobe, and about two hundred and fifty miles north of the lake. As no plants have as yet been brought from those parts of Africa, I trust these may prove interesting to you. Mr. M'Cabe unfortunately lost his memorandum-book, and the notes of the locality of each plant, etc., and the slight note I have appended to each is what he gave me from memory after his retnrn. I have kept duplicates of each, numbered to correspond; and if at any time you should have leisure to give me the specific names, I shall feel greatly obliged. I have now a large herbarium, and, by furnishing traders and others with paper and boards, and giving them hints as to the mode of drying, as I did to Mr. M'Cabe, I am continually adding to it. I have still the duplicates of five hundred plants sent to you some seven or eight years ago, numbered as were those I sent; I fear some of them never reached you. I had also three cases of *Proteaceæ* ready to send, but a war broke out, and they remained here till the bottoms rotted out.

I send you also a few plants I collected last year in Namaqualand, near the west coast (in November and December, 1854). You will find two species of the Orange River Ebony, which Sir J. Alexander calls a *Royena*,* but which turns out to be a *Euclea*. I hope soon to be able to send a specimen of the wood for the Museum, which I hope has fully answered your expectation.

You will find also a few Ferns, gathered in the kloofs close to this town; one is a remarkable growth on the crown of a Tree Fern (*Hemitelia*), which grows from the base of the fronds. I send one with a portion of the frond attached, to show that it is *not* a parasitic Fern. There are several Ferns growing on the stems of the *Hemitelias*, of which there is a large forest, growing to the height of eight or nine feet, with enormous fronds (of which I send a small portion), close to town. If it would be acceptable, I can easily send you one of these Tree Ferns, but whether it will live or not I cannot tell; perhaps when we get a line of steamers established I may succeed.

Our Botanic Garden is progressing favourably, and I hope we shall be able to erect in it a handsome glass conservatory, sixty feet long and twenty feet high, which my father got out a few days before his death for his own private use, at an expense of £535. It is on the plan of the Crystal Palace, and will be a great acquisition;—all iron and glass.

I hope I shall be able to get Mr. Shepstone to take a few dried specimens of the "Jackal's Kolt" (*Hydnora*), which grows parasitically on

* It is *Euclea Pseudo-Ebenus*, E. Mey.

the roots of a species of *Euphorbia* in the Karoo Veldt, in the colony, and also in Namaqualand. The fruit is very good, and is keenly hunted for by Bushmen and wild pigs, jackals, and many other animals. I have frequently eaten it in Namaqualand, where it attains the size of a small Orange. Those I send you come from the district of Graaf Reynet.

Before my return from Namaqualand I was attacked by the fever, which completely prostrated me for more than a month, and my collection of plants was destroyed and lost. I only saw one Fern, a *Ceterach*. It is a most dreary, desert country, almost *entirely* destitute of water and vegetation in summer; a few stunted trees (chiefly Willows, Eucleas, and Tamarisks) grow in the *middle* of what are called the river-beds,—not on the banks, as in other countries. But Namaqualand possesses only *traditionary* streams (except of course the Orange River): few are known to have run more than two or three times in a lifetime: so the trees have only a slight chance of existence even in the middle of the sandy bed. I have seen flowers apparently in full bloom, bright and fresh, yet when I have touched them they have fallen to powder! These must have had a sun-stroke, and been killed before they had time to fade—a kind of floral apoplexy. Perhaps the sun emerged suddenly from behind a thunder-cloud, and killed them. Many green bushes were in the same dry powdery state. The thermometer rose to 140° in one minute on my placing it on the ground.

Collections of Dried Plants *on Sale with* Mr. Samuel Stevens, 24, *Bloomsbury Street, London.*

We have pleasure in informing botanists that Mr. Samuel Stevens has the following sets of plants on sale, from different parts of the world, at his residence given above:—

No. 5 and 6 of *Signor Botteri's* plants from Dalmatia: about 250, at 25*s*. per 100.

39 plants, various, from Broken Bay and Sydney, Australia, *F. Strange*, collector.

56 ditto, ditto.

37 ditto, ditto.

32 Ferns, Australia, New Zealand, New Caledonia, etc., *F. Strange.*

34 ditto, named.

20 ditto, ditto.

129 Zoophytes, Seaweeds, Corallines, etc., Natal, *R. W. Plant.*

24 Ferns, Natal, *R. W. Plant*, No. 6.

Ditto, ditto, No. 7.

Several sets of Mr. Plant's Natal Mosses, arranged by W. Mitten.

137 Specimens of Fendler's Chagres Plants.

112 ditto, ditto.

65 ditto of Fendler's New Mexican.

63 ditto, ditto.

N.B. The above are all offered at the rate of 40*s*. per 100.

217 North American plants (named), being No. 12 of *D. Douglas's* collecting, price £3 the set.

68 Cape de Verd plants, St. Jago, *Forbes*, price 20*s*.

84 New Holland plants, collected by *James Brogden*, price 25*s*.

18 Cape de Verds, St. Jago, *G. Don*, 7*s*.

Duffield's Swan River plants, 79 species (small specimens), 25*s*. the set.

Seed-vessels, etc., of *Banksias*, etc., 20*s*. the set.

Plants from Spain, about 200 species, principally from neighbourhood of Malaga and Granada, would make three good sets, price £4.

Two large sets of *Zeyher's* South African plants, about 1100, price the set.

A few capital sets of *Signor Botteri's* Mexican plants, about 400, at 40*s*. per 100.

Wallace's Borneo Ferns,* 30 to 40, at 50*s*. per 100.

Harvey's Australian Algæ.

Our pages have made known the fact of our distinguished Algologist and friend, Dr. Harvey, having made an extensive voyage and very fatiguing journeys, mainly for the purpose of supplying his own and other herbaria with the marine productions of the Australian seas. We say other herbaria, because he announced his willingness to receive names of subscribers who might desire to possess sets. The long voyage, of three years' duration, has been happily accomplished; and, with his accustomed industry, the sets, most beautifully preserved, are prepared, accompanied by a list of species, correctly named; and they are either now distributed, or on the eve of distribution, and more subscribers have recently come forward than can be supplied.

The set now before us comprises 601 numbers, very few indeed being in any sense repetitions or doubtful kinds; so that the number

* Among which are some species of great rarity and beauty.

of distinct species can be little short of 580; a very great proportion of which have never been before described. They were collected on the coasts of Freemantle, Western Australia; King George's Sound; Cape Riche; Port Fairy, Port Phillip Head, and Western Port, Victoria; Brighton beach and Geelong, Port Phillip, Port Jackson, Newcastle, and Kiama, New South Wales; Georgetown and Port Arthur, Tasmania; and Auckland, New Zealand.

Words cannot describe the exquisitely beautiful structure and delicate colouring of many of these species, which throw the *Algæ* of other seas quite into the shade,—we especially allude to the group of *Rhodospermeæ;* for example, the *Claudea elegans* (of which the samples hitherto existing in our herbaria have been comparatively but fragments), the *Mertensiæ* (of which there are two new species), the *Hanowiæ*, the *Dasyæ*, *Laurenciæ*, *Asparagopsis*, *Wrangelia*, *Delesseriæ*, *Nitophylla*, *Kallymenia cribrosa* (a purple-rose-coloured membrane, two feet or more in length, all perforated with minute, perfectly circular openings), *Halophlegma*, *Balliæ*, etc.;—these are no less remarkable for their roseate hues, than are some of the *Caulerpæ*, *Bryopsis*, etc., among the *Chlorospermeæ*, for their bright herbaceous tints.

This series of *Algæ* is one of the most valuable contributions to Cryptogamic botany of the present century, and such as no one but the author of the 'Manual of the British Algæ,' 'Phycologia Britannica,' 'Nereis Australasica,' etc. etc., could have accomplished.

Plants of Chili.

Through M. Huet du Pavillon (Rue Verdaine, Geneva), we have received a very beautiful series of plants from Chili, collected in different and distant portions of that Republic by M. Ph. Germain, many from the higher Andes (218 species), excellent specimens, and extremely well prepared. Many are of great rarity; and such a collection is of the greater interest, now that we possess a Flora of Chili, by M. Claude Gay ('Historia Fisica y Politica de Chile: Botanica'), where they are, at least the majority of them, described. We believe all the sets hitherto sent were immediately disposed of, but we know that M. Huet du Pavillon is expecting another consignment from M. Germain: and we trust that so good a collector and so good a botanist (for the specimens are all ticketed and named), will extend his researches to the eastern side ofthe Chilian Andes to the plains of Mendoza.

NOTICES OF BOOKS.

REICHENBACH, L., *et* H. G. FIL.; ICONES FLORÆ GERMANICÆ *et* HELVETICÆ, simul Terrarum adjacentium, ergo Medio Europæ. Vol. VIII. Decades 1–8, color. 4to. Leipzig.

This is a very remarkable work, in illustration of the Botany of Middle Europe, begun some twenty-three years ago, and continued, with a slightly altered title, to the present day. The 'English Botany' of Sir James E. Smith and Mr. Sowerby was long considered to be the only completely illustrated Flora of any given country in Europe. The present promises to be equally satisfactory of a much greater extent of country than Great Britain and Ireland, and is superior in these two respects: (1) that the plates are issued in Families, and (2) the dissections and analyses are very superior. Whether the great multiplicity of species is to be considered an improvement, is a question upon which different views may be anticipated. The present volume (eighteen) commences with the *Labiatæ*, to which the eight decades now issued are all devoted, as will no doubt several future ones. The very fact of illustrating all the species of a genus, and even of an Order, within a short space of time, implies that a great number, probably the majority, of the figures are drawn from dried specimens. But the universally acknowledged botanical skill and artistic talents of the authors warrant the assurance that both figures and dissections are true to nature. The work too is economically published.

FILICES EXOTICÆ.

Mr. Lovell Reeve is about to announce a work in 4to, with coloured plates, from the pencil of Mr. Fitch, a work on *Exotic Ferns*, including the *Lycopods* (*Lycopodiaceæ*), especially of such as are most worthy of cultivation.

Annales Botanices Systematicæ.

The useful work under the above title, which was suddenly brought to a close by the death of the industrious editor, Dr. Walpers, is about to be continued by Dr. Carl Müller, and we trust soon to be able to notice the first Part of Vol. IV., which is, we are told, published.

Notes made during the recent Expedition across the NORTHERN PORTION *of* AUSTRALIA, *under the command of* Mr. Surveyor Gregory; *by* DR. FR. MUELLER, Colonial Botanist of Melbourne, and Botanist to the Expedition.

(*Continued from p.* 173.)

Sydney Botanic Gardens, March 6th, 1857.

My dear Sir William,—I have been during the last week engaged in putting the botanical specimens into order which were obtained during the latter part of the North-Australian expedition, and have been able to fill a box with about a thousand specimens, comprising nearly two hundred and fifty species. These will be brought to you by my friend Mr. Elsey, the surgeon and naturalist of the Expedition. He leaves in a few days in the 'Alnwick Castle,' and I send this letter by the mail, to apprise you of his arrival. I have copied somewhat more than that part* of the manuscripts which relates to the now transmitted plants (*Thalamifloræ* and part of *Calycifloræ*). This set of papers will also be delivered by Mr. Elsey, and in a month or two another set of manuscripts and specimens will follow.

I regretted, when I commenced arranging the collection, that the schooner 'Messenger,' on board of which my principal botanical treasures are, had not arrived, as having the whole of the specimens at once under hand would have simplified so much the work. Since then I have anxiously been expecting the schooner's arrival, and from day to day our fears are increasing that some great calamity might have befallen those on board her. The 'Messenger' left Java in the beginning of September, in order to meet us at the Gulf of Carpentaria (Albert River), and no tidings of her have reached, since that period, any place in the South.† Although she is known to be a slow vessel, and although she had to contend with the north-west monsoon on her home voyage, yet we cannot banish our fears for her safety and the lives of our friends in her; moreover the passage through Torres Strait is such a dangerous one.

In my last letters I have given you a brief account of the results, particularly the botanical results, of our exploration, explaining at the

* This has safely reached our hands through the favour of Mr. Elsey, together with a large packet of seeds formed during the journey.

† The news of the safety of the 'Messenger,' but, unfortunately, of the total destruction, through damp, of the collections alluded to, has since reached us.

same time the reasons of my postponing the home journey, of which I anticipated such delight and advantage. These letters, both forwarded from Melbourne, no doubt will have arrived in due time. I have also answered your letters of 1855 on these occasions, and am now only receiving my botanical information for awhile through your Journal. But is it not gratifying that, by the accelerated and shortened steam-communication with Europe, your antipodes are enabled to peruse your instructive periodicals and writing in less than two months after their appearance? Through Dr. George Bennett, in whom I have found a very kind man, of high scientific accomplishments, I received a week ago the complete volume of your Journal of last year, and can thus now already thankfully acknowledge all your manifestations of favour to me. I am particularly obliged for your good opinion of my services in North Australia, but feel sure your kindness has overrated them by far. Most thankfully I receive also your valuable information upon some of my former plants, and was much pleased with the fine figures of *Duttonia* and *Andreæa*.

I owe my thanks also to Mr. Mitten for reviewing my Mosses from the Alps, and venture to hope that your great mycologist in England will place me under similar obligations, although the continuance of such important collections as Mr. Spruce's must as a matter of course throw the *Fungi* of my collection into the background, although I should have been glad to hear at least Mr. Berkeley's opinion about that curious plant which looks more like a piece of an old brush than anything else. It was only once found on *Eucalyptus*-trees near Adelaide. In Mr. Berkeley's department I have, as the results of this expedition, actually nothing to offer, and the number of Mosses and other Cryptogamics was equally scarce in North Australia; still Mr. Mitten might perhaps be able to find good contributions amongst what I collected on the east coast, and I have not made use of my privilege of keeping a specimen of those plants, in order to furnish the best material. From a kind letter of Professor Alexander Braun, I learn that he continues unceasingly to augment our knowledge of *Charæ* and allied Orders; and although the specimens of these brittle plants have suffered much by friction and pressure, still I think half-a-dozen species of *Chara* are determinable, and it would be interesting to learn whether they differ from Indian and extratropical Australian species.

I am sorry to add that, with a heat of more than 120° Fahr. at

times, to which the collections were exposed, and with the want of consideration on the side of the horses with regard to their valuable burden, many of my specimens have suffered frightfully, particularly such brittle kinds as *Eucalyptus*, *Loranthus*, *Capparis*, etc., of which I am now obliged in many instances to place the remaining fragments in paper capsules. Let me however, Sir William, state, that you receive always the whole of the specimens of every rare kind, nothing of many species having been retained at all, or that I satisfied myself with a solitary leaf and flower, or fruit, in many cases. Indeed, since I have been able to derive the requisite information on almost all the plants collected, there is very little desire on my side to augment my private herbarium, the plants being so much more useful at Kew than in Australia. All my wishes are concentrated upon the point, to discharge my duties faithfully, and to the satisfaction of the Government. Since writing the first part of this letter I have placed all the *Cryptogamiæ* in order, and have added more *Calyciflore* to the last packed up, so that at least 1200 specimens will be forwarded this time, including also all the duplicates of a collection presented to me by Mr. Hill, of Brisbane, the exact number of species being 304.

The mail is soon closing, and, having just finished copying the descriptions corresponding to the now transmitted plants, I beg to sum up their principal contents. 160, for the greater part unknown plants, are in the transmitted pages fully described, chiefly from living specimens, and the characters of 16 new genera are given. Unless specimens and notes on board of the 'Messenger' are lost, this will comprise only one-fourth of my writings, at least with regard to species.

Menispermeæ comprise two species of *Cocculus* and one of *Stephania*, which, with a fourth species of Moreton Bay and the Snowy River *Cocculus*, advances the Order to five species in Australia, none being previously described from this country unless by recent labours of Miers, to which I have no access.

Nymphæaceæ seem to be reduced to two species in Australia, common throughout the tropics, but little beyond. I stated erroneously to have seen *Nymphæa cærulea*, for both belong to the section *Lotus*, one being unquestionably your *N. gigantea*, although I never observed flowers of such a diameter as Mr. Bidwill described. The other I have failed to identify with any Indian species. Had I not seen the manifold varieties of these two kinds, I might have been induced to pronounce the

occurrence of half-a-dozen species here. Colour of petals is no character here of these plants whatsoever.

Nelumbieæ. The notes from fresh specimens will, I think, prove the identity of ours with the Pythagorean plant.

Capparideæ. Of *Capparis* four kinds were noticed, besides those of Sir Thomas Mitchell's discoveries, one forming a noble tree at Moreton Bay. *C. lasiantha* (the epidendric *Capparis* of Leichhardt), and *C. umbonata* extend as far as the Victoria River.

Rutaceæ. Two species of *Boronia* in North-western Australia are remarkable for having much longer sepals than petals; one with pinnate grey leaves resembles *Artemisia* from the distance, which suggests the appellation *B. artemisioides.* Three other species were noticed, including *B. bipinnata*, Ldl. Of *Zieria* a new kind, with extremely minute flowers, and the habit almost of a *Xanthosia*, occurs on the Glasshouse Mountains; and I discovered also a singularly granulated narrow-leaved species from Sir Thomas Mitchell's collection, not appended to his work.

Cedreleæ. In the Brigalow Scrubs of Eastern Australia a new genus of this Order forms a constant companion of *Eremophila Mitchelli.* The capsule, although not seen in perfect maturity, seems to remain coriaceous; the placental laminas are two-seeded on each side, and the seeds of all around winged, thus tending to disrupt the limits between *Flindersia* and *Oxleya;* and I should, notwithstanding the want of woody structure of the capsule, have united the three genera, were the flowers of *Oxleya* known, and did not this new genus, now celebrating the fame of a third Australian explorer, Count Strzelecky, distinguish itself habitually by opposite small leaves and a foliaceous rachis of the leaflets.

Aurantiaceæ, a very small Order in Australia, becomes augmented by a well-marked *Glycosmis* from the Burdikin.

Hippocrateæ seemed to be unknown from this part of the globe. A species of *Hippocratea*, allied to *H. obtusifolia*, with bearded flowers, occurs on the banks of the Brisbane.

In *Polygaleæ* a new species of *Comesperma* with spreading leaves (*C. patentifolium*) was noticed in Eastern Australia, besides *C. sylvestre*, Ldl., and *C. limarifolium*, A. Cunn. *Polygala* occurs in four species in the North. *Salomonia*, noticed by R. Br., was not observed during Mr. Gregory's expedition.

Erythroxyleæ have a solitary but very common representative in

Eastern Australia, no doubt the plant mentioned by Professor Lindley in his valuable 'Vegetable Kingdom.'

Of *Pittosporeæ* I obtained two new genera in Eastern Australia, besides a new *Pittosporum* from Arnheim's Land, as well as some additions to the latter genus from Central Australia, contained in the not yet arrived division of the collection.

Amongst *Olacineæ* we meet the strange face of a *Ximenia*, allied to the New-Caledonian *X. elliptica*.

Ampelideæ comprise only the genus *Cissus*, but this in seven well-marked species, whereas I find only *C. Baudiniana*, Brouss. (very improperly called *C. antarctica* by Vent.) enumerated amongst Australian plants by previous writers. A *not*-climbing herbaceous species from the Victoria River (*C. acida*) proved useful as an antiscorbutic vegetable.

Sapindaceæ exhibit some of the finest trees in Eastern Australia. That section of *Nephelium* separated by Professor Blume as *Arytera* contains four very distinct species. *Atalaya* seems also to occur. *Heterodendron*, very properly referred to this Order by Dr. Planchon, differs scarcely from *Arytera* except in simple leaves and apetalous flowers, if not in structure of the embryo (the fruit not being found in sufficient maturity for examination); a species with toothed leaves (*Heterodendron diversifolium*) has been added from the Brigalow Scrubs of Eastern Australia. *Distichostemon* and *Apophyllum* form remarkable genera of this group, both producing indefinite stamens, the former allied to *Dodonæa* with foliaceous wings to the capsule, the latter a quickly defoliated bushy tree, resembling a *Hakea*, with polygamous flowers, an often two-seeded indehiscent fruit with circinate embryo. *Dodonæa filifolia* (of which however no authentic specimens have been seen) I reduced to *D. acerosa*, Ldl., and *D. mollis* and *triangularis* have been united as *D. Lindleyana*. *D. physocarpa* is remarkable for inflated, generally six-winged seed-vessels, and *D. polyzaga* singular for numerous pairs of leaflets. The latter surpasses even your *D. vestita*, which we never found, in beauty; but both, as well as several other kinds from North-western Australia, are wanting in this part of the collection. *D. platyptera* differs from *D. Preissiana* in very broad upward truncated wings, and *D. oxyptera*, like *D. physocarpa*, a pinnate-leaved species, is distinct from the rest in acute wings.

The *Meliaceæ* I may perhaps consider as the most interesting part of my collection, since the Order seemed formerly to be so scantily developed

in Australia, and since it introduces some entirely new features into the family. For remarkable appeared to me a genus of the Trichileous section with drupaceous fruit, to which I have no doubt the *Fusanus* with pinnate leaves, spoken of by the unfortunate Leichhardt, must be referred. Four species are described in the now transmitted pages; a fifth sp. (*vernicosa*) is common on the sandstone table-land of the Victoria River, and I think a sixth species occurs in Central Australia, in the desert scrub. This genus, after having been confirmed by you, I ardently wished, as one of the finest resulting from this expedition, to dedicate to Professor Owen, faint as this token may be of my veneration for the illustrious zoologist. In another genus, with long unilaterally-slit columna, allied to *Quirisia* and *Turræa*, I wished to acknowledge the contribution of many botanical specimens to the collection by our amiable travelling-companion Mr. J. R. Elsey, the surgeon and zoologist of the Expedition. Notable in this Order is also a very marked *Hartighsea*, next to *H. excelsa*, obtained in a conjoint trip with Mr. Hill to the upper parts of the Brisbane River, whose name I wished it to bear; and a second *Azadirachta*, unfortunately only seen in fruit, which however so far exactly agrees in generic characters with the Indian prototype *Melia Azedarach*, or, if you like, *M. Australis*, Sweet (*M. Australasica*, Juss.) is scattered throughout the tropics.

Reviewing *Sterculiaceæ*, I find that *Sterculia quadrifida*, R. Br., occurs in Arnheim's Land and eastern subtropical Australia; that *Brachychiton diversifolium* is restricted to North and North-western Australia, where *B. populneum* does not occur; that *B. platanoides*, R. Br., ranges from eastern subtropical Australia to the Gulf of Carpentaria, whilst *B. ramiflorum*, R. Br., is common through the tropical zone. *Sterculia fœtida*, enumerated by R. Br. in his excellent paper in Horsf. and Benn. Pl. Rar. Jav., as also inhabiting Northern Australia, has not been seen by us, nor *Brachychiton incanum* found on the north shore, unless a plant which I ventured to describe as *B. discolor*, upon rather insufficient material, a forest tree of the Richmond and Clarence rivers (New South Wales), should prove identical with it, which cannot be decided without consulting Cunningham's herbarium. I send you also a diagnosis of the Flame-tree of Illawara (*Brachychiton acerifolium*, *Sterculia acerifolia*, A. C. in Loud. Hort. Brit. p. 392), *B. luridus*, C. Moore, and *B. pubescens*, C. Moore, all three not contained in R. Brown's monograph. If the direction of the radicula is at all of any value in the distinction of Sterculiaceous genera, then I cannot agree with the

W Fitch del. et lith.

Vincent Brooks Imp.

Bryocarpum Himalaicum, *Hf & T.*

illustrious Brown in referring *Delabechea* to *Brachychiton* (conf. App. to Sturt's 'Central Australia,' ii. p. 66), but leave it intact, according to Professor Lindley, between *Brachychiton* and *Sterculia*. This tree, I may mention, varies with *digitate* leaves, which indeed seem to be the typical ones, and simple leaves, nor does it but in very rare instances assume that degree of turgidity of its stem which the woodcut in Mitchell's Trop. Austr. represents. *Brachychiton populneum* may occasionally, when growing out of the fissures of granite rocks, be seen assuming the same extraordinary form. Yet *Delabechea* is always perceptibly contracted at the bottom and summit of its stems, more so than other *Sterculiæ* with which I am acquainted.

I cannot conclude this review of Australian *Sterculiaceæ* without alluding to a species of *Brachychiton* (if not *Delabechea*) originally discovered by Mr. A. C. Gregory in his exploration of the northern parts of Western Australia. He found the tree as early as 1848 on the Murchison River, when discovering the Yaraldine lead-mine: it attracted his attention as being the only deciduous tree of Western Australia, and fruit specimens were at the time communicated to Mr. Drummond.*

(*To be continued.*)

On BRYOCARPUM, *a new genus of* Himalayan PRIMULACEÆ; *by* J. D. HOOKER, M.D., F.R.S., *and* T. THOMSON, M.D., F.R.S. (With a Plate, TAB. V.)

The remarkable plant now described is very closely allied to *Soldanella*, but differs from that genus in colour of the flower, in the narrower tube of the seven-lobed corolla, whose lobes are obtusely bifid and not laciniate, in the seven stamens inserted at the top of the tube of the corolla, and in the absence of scales at the throat of the latter.

* According to Mr. Gregory's information, whose name ought in justice to be attached to this species, it forms a tree 10–20′ high, with slightly rough bark, thin, palmate. Beyond the middle five-cleft leaves, which are shining above, glabrous, and about 4″ long, lobes acute, leafstalk about 2″ long. Flowers small, greenish-yellow, in bunches. Follicles sometimes as many as 30 or 40 conjoined, 2″ long, outside smooth, twice as long as their stalk, thinly coriaceous, like in *Delabechea*. Seeds 12–15, smaller than in Mitchell's Bottle-tree, imbedded in the follicle and scarcely hairy. The stem is cylindrical; the branches are whorled and form a hemispherical head. It is the only Western Australian Sterculiaceous tree.

Bryocarpum, *H.f. et T.*

Calyx 7-fidus, lobis subulato-lanceolatis. *Corolla* infundibuliformi-campanulata, ad medium 7-loba, lobis linearibus apice obtuse bilobis, fauce nuda. *Stamina* 7, fauce corollæ inserta; filamentis brevibus; antheris oblongis, acuminatis. *Ovarium* lineari-oblongum, squamulosum; stylo æquilongo; ovulis placentæ axillari columnari adnatis. *Capsula* elongato-cylindracea, membranacea, striata, apice operculo longe rostrato dehiscente. *Semina* matura non visa.—Herba Himalayæ orientalis *spithamæa ad pedalem;* rhizomate *crasso;* foliis *omnibus radicalibus, petiolatis;* petiolo *late alato;* lamina *ovata v. cordato-ovata, obtusa, obscure crenata, subtus pallida, squamulis orbiculatis sparsa;* scapis 1–3, *gracilibus, erectis,* 1-*floris;* floribus *nutantibus, flavis, inodoris.*

1. Bryocarpum *Himalaicum*, *H.f. et T.* (Tab. V.)

Hab. In sylvis temperatis Himalayæ orientalis, prov. Sikkim, alt. 8–1100 ped. (fl. Maio).

Rhizoma crassitie digiti minoris.—*Folia* 1–3 unc. longa, petiolo æquilonga, membranacea, læte viridia. *Scapi* foliis 2–4-plo longiores. *Flores* ½–⅔ unc. longi. *Corolla* calyce duplo longior, lobis subpatulis. *Capsula* pollicaris, erecta, striata, striis tortis.

Plate V. Fig. 1. Portion of under surface of leaf, with squamulæ. 2. Flower. 3. The same, with the corolla laid open. 4. Stamen. 5. Squamulæ from the ovary. 6. Apex of scape and young fruit. 7. Ditto, with old capsule. 8. Unripe capsule laid open. 9. Unripe seed:—*all* but fig. 6 and 7 *magnified.*

On Loxodiscus, *a new genus of* Sapindaceæ *from* New Caledonia; *by* J. D. Hooker, M.D., F.R.S. and L.S., etc. (With a Plate, Tab. VI.)

Char. Gen. *Sepala* 5, inæqualia, oblonga, obtusa, glanduloso-dentata. *Petala* 5, subæqualia, breve unguiculata, oblonga, obtusa, intus pilosa. *Discus* obliquus, carnosus, postice incrassatus, 7-lobus. *Stamina* 7, uniserialia, subunilateralia, declinata, postica minora, omnia æstivatione incurva; antheris oblongis; filamentis filiformi-subulatis, incurvis. *Ovarium* breviter stipitatum, elliptico-oblongum, glandulis stipitatis

W Fitch del et lith

Vincent Brooks Imp

[illegible] coriaceus, Hf.

onustum, in stylum brevem paulo curvum subulatum desinens; 3-loculare; loculis 2-ovulatis; stigmate simplici. *Ovula* superposita, horizontalia, globosa, arillata?; funiculo breviusculo, crasso. *Fructus* ignotus.—Frutex Novæ-Caledoniæ, Kœlreuteriæ *affinis, glaberrimus, ramosus;* ramulis *cylindraceis, cortice brunneo;* foliis *alternis, imparipinnatis;* petiolo *gracili, strictiusculo, subangulato;* pinnis *oppositis alternisque, coriaceis, lineari-oblongis, obtusis, obtuse serratis, basi oblique cuneatis, in petiolum brevem angustatis, superne læte viridibus, lucidis, subtus pallidioribus, nervis divaricatis;* panicula *terminali, erecta, multiflora,* ramis ramulis*que crassiusculis, pallidis, strictis, angulatis, basi bracteatis;* bracteis *linearibus, coriaceis;* floribus *breve pedicellatis, obliquis, roseis, post anthesin nutantibus.* (Nomen e λοξος, inæqualis, et δισκος.)

1. Loxodiscus *coriaceus, H.f.* (Tab. VI.)

Hab. Prope summum montis Insulæ Pinetorum Novæ-Caledoniæ: legerunt M'Gillivray et Milne itinere Navarchi Denham (Octob. 1853).

Frutex 6–8-pedalis. *Folia* stricta, 6–8-pollicaria; pinnis 1–2-uncialibus. *Panicula* spithamæa. *Flores* $\frac{1}{2}$–$\frac{2}{3}$ unc. diametr.

Plate VI. Fig. 1. Flower. 2. Petal. 3. Stamen. 4. Calyx, disc, and germen. 5 and 6. Ovary, cut transversely and longitudinally:—*all magnified.*

North-Australian Expedition; *Letter from* A. C. Gregory, Esq., *Commander of the Expedition.*

Our Journal will, through the labours and communications of Dr. Mueller, contain so much of the botany of this remarkable and successful Expedition, that we are anxious it should contain also the record of the route, as narrated by the Commander, in three Letters, addressed to his Excellency the Governor-General of Australia, and ordered by the Legislative Assembly to be printed. The first letter is as follows:—

Victoria River, 14th June, 1856.

Sir,—Circumstances having arisen which render it necessary that the vessel attached to the North-Australian Expedition should proceed to Timor for supplies, I avail myself of the opportunity to transmit a brief account of the operations of the Expedition to the present time, and its prospective movements.

2. In my letter of the 23rd September,* 1855, I detailed the proceedings of the expedition to that date, the 'Monarch' sailing the next morning.

3. Having organized a party to proceed by land, with the horses, to the upper part of the Victoria, consisting of myself, Mr. H. Gregory, Dr. Mueller, Overseer Phibbs, and six men, the remainder of the party embarked in the 'Tom Tough' schooner, to which the sheep had been removed from the 'Monarch;' Mr. Wilson being instructed to ascend the Victoria and form a camp at some suitable spot for disembarking the sheep, if practicable, near Kangaroo Point, and in accordance the schooner sailed from Point Pearce on the 25th September.

4. On the 28th, I started from the camp at Providence Hill with the horses, which had been reduced to forty-one, and many of these scarcely able to travel. Pursuing an easterly course through level forest country of indifferent quality till the 3rd October, when we ascended the Macadam Range, which proved to be only the deeply serrated edge of the vast sandstone table-land which occupies so much of the north-west coast of Australia.

5. On the 4th October one of the horses was seized with sudden illness, and died in four hours; and on the 10th a second horse was lost, under similar circumstances.

6. On the 11th the party reached the Fitzmaurice River, and camped on a small dry creek, but the tide rising in the night, the alligators ascended the creek from the river, attacked the horses which were feeding on the bank, severely wounding three. On the same day a horse had been abandoned, being too weak to travel.

7. Crossing the Fitzmaurice River on the 13th, at the lowest point at which it was fordable, the water was fresh, twenty yards wide and two feet deep, with a rapid current. Steered southward, and traversed some fine grassy valleys during this day, but soon reaching the stony hills beyond; were compelled to leave two more horses, as they were completely exhausted, having been for some days so weak that they could not rise without assistance.

8. The country now became more rocky, so that we did not reach the banks of the Victoria till the 18th, when, after a difficult ascent from Sea Range, we camped one mile north of the 'Dome.'

9. The two following days were occupied in travelling up the Vic-

* Information, nearly to that date, was communicated to us by Dr. Mueller, and is given at p. 46 and following pages of the last volume (viii.) of this Journal.

toria, the distance being greatly increased by having to head a deep salt-water creek, which joined the river opposite Kangaroo Point. On the 20th reached the camp which had been established by a party from the schooner, on the left bank of the river, in lat. 15° 34′.

10. Here I learned that the schooner had got aground about eight miles below Curiosity Hill on the 27th September, and had not yet been got afloat, though the tide had driven her over several banks; that she had sustained much injury, and leaked so much that a large quantity of the stores were damaged.

11. The following day I proceeded down the river in one of the boats, and reached the 'Tom Tough' on the 22nd.

12. The schooner had not moved for some days, and the leaks were in some degree lessened by nailing battens and tarred blankets over the seams which had opened. Being bedded four feet in the sand, I could not examine her bottom, though the bank was dry at three-quarter ebb.

13. Several of the deck beams were fractured, and there were many indications of her being much strained by the tide having worked deep holes at the bow and stern, and then leaving her dry on a narrow bank amidships.

14. The tides were too low to float her till the 24th; after which, every succeeding tide carried the vessel a short distance higher up the river, and on the 27th cleared the banks and reached Sandy Island. On the 29th she moored at the Camp, where there was a convenient spot for discharging the cargo and repairing the vessel.

15. On examining the schooner, the keelson was found to be broken near the mainmast, three of the deck beams broken, and almost all the knees which secure the deck much strained from their places, the butts of several of the planks started, and much of the copper torn off.

16. There having been, on several occasions, three feet water in the vessel's hold, much of the cargo was damaged; more than half the bread, sugar, and other dry provisions belonging to the vessel being wholly destroyed. The stores belonging to the Expedition, from being more carefully packed, did not suffer so much, about half a ton of flour, the same quantity of rice, 3 cwt. of salt, and 8 cwt. of sugar being destroyed; besides which, many packages of stores were damaged by the water leaking through the deck.

17. The greatest loss however which the Expedition has sustained,

is the large number of sheep which have perished, owing to the long detention on board the schooner. Out of 161 sheep embarked at Point Pearce, only 44 reached the Camp with sufficient vitality to recover.

18. The early part of November was devoted to erecting a store, and discharging cargo from the vessel preparatory to repairing her.

19. This being the driest season of the year, the horses had not improved sufficiently in condition to fit them for work; on the 15th I therefore attempted to ascend the river in the gutta-percha boat, but soon after passing Palmer Island, the dry banks became so extensive that I relinquished the attempt, and returned to the Camp. The heat of the sun having so completely destroyed the texture of the waterproof canvas of which the boat was constructed, that it was scarcely kept afloat towards the latter part of the return voyage.

20. A few showers of rain having somewhat refreshed the grass, the horses showed some improvement; I therefore selected seven of the strongest, and on the 24th proceeded up the Victoria with a party consisting of Mr. H. Gregory, Mr. Wilson, and Dr. Mueller.

21. Leaving the river a short distance below Steep Head, made a *détour* to the southward, and, traversing a fine grassy country, which extended to Beagle Valley, struck the river a few miles above the highest point examined by Captain Stokes.

22. Following the river upwards, passed to the east of Fitzroy Range, and entered a deep gorge or ravine, bounded by cliffs of sandstone, from 50 to 300 feet high. Through this ravine the river wound, forming deep reaches, sometimes several miles in length, and only separated by narrow banks of shingle or rock. The average course being nearly south, we soon reached lat. 16° S., when the valley suddenly expanded into a vast plain, covered with excellent grass. In this plain were several isolated hills of trap or basaltic rock, the decomposition of which adds much to the fertility of the soil.

23. Having traced the Victoria to lat. 16° 26′, long. 131° 10′, we returned to the Camp, which was reached on the 13th December.

24. During our absence, such of the men as could be spared from the general duties of the Camp, had been employed cutting timber for strengthening the frame of the schooner.

25. The wet season had now set in, and the surface of the country became so soft that the horses could scarcely be collected together at the Camp.

26. The rugged character of the precipitous sandstone ranges which intersect the country, and boggy condition of the plains, combined with the fact that the greater part of the horses suited for draught had been comprised in the number of those which had died, precluding the employment of the drays, it became necessary to explore the country with packhorses; accordingly a party was organized, consisting of Mr. H. Gregory, Mr. Baines, Dr. Mueller, Mr. Flood, Overseer Phibbs, Bowman, Deans, and Fahy, thirty packhorses and six saddle-horses.

27. With this party I started, on the 3rd January, 1856, to explore the interior, south of the Victoria.

28. The flooded state of the country near the Victoria compelled us to traverse the rocky ranges to the westward of the river. The rugged nature of the country, the intense heat of the atmosphere, loaded with moisture, conjoined with the ordinary difficulties which attend exploration in a new country, rendered our progress extremely slow. Many of the horses were lamed, though shod before starting, and two had died before we reached lat. 17°.

29. I therefore selected a suitable spot for a depôt, in lat. 17° 3′, long. 130° 35′, and, on the 31st January, proceeded with Mr. H. Gregory, Dr. Mueller, and Charles Deans, seven pack and four saddle horses, leaving the remainder of the party in charge of Mr. Baines.

30. Steering a southerly course, on the 7th of February we reached the southernmost waters of the Victoria, in lat. 18° 12′, long. 130° 39′, and crossed the dividing ridge between the waters flowing to the north-west coast and those which fall into the interior; the elevation, by barometrical measurement, being only 1300 feet above the level of the sea. Continuing our route, we descended into a nearly level and depressed country, and struck a small watercourse, trending to the south-east. On its banks there was abundance of grass, and a little water was found in the deeper portions of the channel.

31. This creek was followed to lat. 18° 22′, long. 130° 49′, where it was lost on a wide grassy plain, surrounded by level sandy country, covered with *Triodia* and stunted trees.

32. On the 9th, lat. 18° 31′, long. 130° 44′ was attained; but further progress was evidently impracticable, as we had reached a sandy desert country, extending far to the south, in which neither water nor grass existed—little or no rain having fallen during the wet season—to the south of the dividing ridge. The elevation of this point was 1000 feet above the sea.

33. I now determined on following the northern limits of this desert to the westward, in hope of finding some creek or river, which, descending from the ranges to the north, might enable us to cross, or at least penetrate, this inhospitable region. Keeping therefore to the west, along the foot of the sandstone range, on the 15th came on the head of a creek in lat. 18°, long. 130°; this creek first trended north-west, but soon turned to the south-west.

34. For the first hundred miles the country on the right bank consisted of vast level plains of rich soil, covered with beautiful grass; but the left bank presented a striking contrast in its low sandstone ranges, producing little beside *Triodia* and scrub trees.

35. The country on both banks now changed gradually to a sandy desert, with low barren sandstone hills, and long parallel ridges of red drifting sand, straight, equal in height, and with a direction exactly east and west. This desert country was not altogether destitute of vegetation, but thinly covered with *Triodia* (the *Spinifex* of Australian explorers) and a few scattered bushes of *Eucalyptus*, *Acacia*, and *Hakea*.

36. After following the stream-bed, which I named Sturt's Creek, for nearly three hundred miles, its channel terminated in a series of dry salt lakes, which occupied the lower portion of a large depression of the sandy desert, the centre being in lat. 20° 16′, long. 127° 35′, and nine hundred feet above the sea-level.

37. No outlet for the waters of these lakes could be discovered, though carefully sought for; and the great height at which the inundations of the country had remained for considerable periods, was evident from the abundance of mussel-shells which remained in their natural position, embedded in the soil twenty feet above the dry bed of the lake, and more than a mile beyond its ordinary limits.

38. Surrounded on all sides by a sandy desert, in which it was hopeless to look for water or grass, and deprived of these essentials, which the creek had afforded in sufficient quantity to enable us to proceed thus far into this inhospitable region, it was useless to attempt to penetrate the country to the southward, and no alternative remained but to retrace our steps while it continued practicable; for as no regular rains had fallen in this part of the country for at least twelve months, our supply of water had generally been derived from small muddy puddles, which resulted from heavy thunder-showers which had fallen in the early part of the month. Most of those water-holes had now dried up;

and I am doubtful whether the horses could have performed the long stages between the remaining watering-places had not the open character of the country enabled us to travel at night and avoid the scorching rays of an intertropical sun.

39. On the 11th of March, commenced retracing our steps up Sturt's Creek, and on the 24th, having reached the head of the creek, struck off to the north-east to avoid the waterless country traversed on the outward route. In lat. 17° 42′, long. 129° 58′ crossed the dividing ridge between the northern and southern waters, the elevation 1660 feet above the sea, and descending into a valley, came on a small dry creek trending north-west. This we followed for thirty miles, and then steered east-north-east for fifty miles over a level grassy country, destitute of water, and reached the depôt Camp in the valley of Victoria on the 28th, found the party in good health, and the horses much improved in condition.

40. As the horses I had employed on the excursion into the interior required a few days' rest, I selected six from those at the depôt; and on the 2nd of April, accompanied by Mr. H. Gregory, Mr. Baines, and John Fahy, proceeded to the eastward, to examine the country in that direction. Traversing for sixty miles a splendid grassy country of trap formation, well watered by numerous creeks, reached the eastern boundary of the valley of the Victoria; then, turning northwards, traced the river downwards to lat. 16° 26′, and connected this route with that in December 1855. Returning to the depôt by a more direct route, reached that Camp on the 17th.

41. On the 21st I broke up the depôt Camp and proceeded towards the lower part of the Victoria River, examining such portions of the right as had not previously been traversed, in order to ascertain if any considerable tributaries joined from the eastward; and on the 9th of May reached the main Camp.

42. The party at the main Camp were all in good health, except Henry Richards, who had lost the use of his right hand from falling down among some sharp reeds, one of which had pierced his wrist. The crew of the 'Tom Tough' had not escaped so well; the carpenter, John Finlay, had died on the 22nd April, and three of the seamen had been left on shore at the camp, that they might be under the immediate medical care of Mr. Elsey, the schooner having been moved down the river on the 2nd of April.

43. Although this great amount of sickness is, in some degree, attributable to the re-development of previous disease, yet it more directly results from the bad quality and improper description of the provisions with which the vessel is supplied, and it had been considered absolutely necessary to furnish provisions from the stores of the Expedition for the use of the schooner's crew, their only remaining provisions consisting of salt beef of indifferent quality, biscuit much damaged by cockroaches, and tea.

44. The 'Tom Tough' was now moored below the shoals at Mosquito Flats, and had been so far repaired, by the unceasing energy of Captain Gourlay, that she was nearly ready for sea, a strong frame having been fixed inside the timbers, the seams caulked, and the butts secured. She now only makes ten inches water *per diem*, whereas that was previously the usual quantity per hour. Great credit is due to Captain Gourlay for the manner in which this work has been performed, having done all the smith's work and much of the carpentering with his own hands.

45. It is now my intention to proceed with the exploration of the country towards the Gulf of Carpentaria, and I have accordingly instructed the master of the 'Tom Tough' to proceed to Coepang for supplies, and thence to the Albert River to co-operate with the land Expedition.

46. The greatly reduced number of horses, and the impracticability of employing the drays for the conveyance of stores, has rendered necessary a modification in the number and arrangement of the exploring parties; and, on the present occasion, I shall employ a party of seven persons, as it is desirable that the party should not be entirely dependent on the assistance of the vessel at the Albert River.

47. The remainder of the exploring party will proceed in the schooner to the Gulf of Carpentaria, and on the junction, at the Albert River, of the two sections of the Expedition, the party will be re-organized, and, if practicable, continue the overland route to Moreton Bay.

48. Enclosed I transmit a sketch of the country traversed by the Expedition to the present time, and as it may render it more intelligible, append a few remarks on the physical character of the country, which may be considered to be a table-land of sandstone. Rising abruptly from the low land on the coast, it attains an average level of 700 feet on the banks of the Victoria, in lat. 15°, 900 feet in lat. 16°,

1600 feet in lat. 18°, which is the maximum, as the country falls to 1300 in 19°, and 1100 feet in lat. 20°.

49. The upper bed of sandstone is about 300 feet thick, and rests on soft white, green, and red shales, which are superincumbent on a coarse cherty limestone and jasper. Large tracts of these two upper strata have been removed, and left large valleys and plains, through which the rivers run. South of lat. 16° 30′ trap or basalt has been poured out into these valleys, and formed plains or table-topped hills, sometimes isolated, but more commonly grouped together.

50. The sandstone, by its decomposition, usually forms a poor sandy soil, but occasionally fine grassy plains. The limestones, which occupy large extents of the valleys, are generally covered by a light loamy soil, producing abundance of grass; but the richest soil results from the trap rocks, which are so largely developed in the upper valleys of the Victoria, that, at a moderate computation, they occupy a million of acres. This, added to the good country on the head of Sturt's Creek, —the lower part of the Victoria and the Fitzmaurice River,—would make an aggregate of at least 3,000,000 acres of available grazing land already traversed by the Expedition.

51. Except iron ore, which is frequent, minerals are rare, only a few traces of copper and slight indications of coal having been observed.

52. Of the vegetable productions little favourable can be said; for, however interesting many of the plants may be to the scientific botanist, yet, with the exception of the Grasses, which are very numerous, there is scarcely a single vegetable production which can be rendered practically useful; timber is scarce—the best growing near Point Pearce.

53. In conclusion, it gives me pleasure to record the ready co-operation and assistance I have experienced on the part of the officers, and the exemplary conduct of the men attached to the Expedition, and that under circumstances of privation which few who have not experienced them can fully appreciate.

I have the honour to be, Sir, your obedient Servant,

A. C. Gregory.

His Excellency the Governor-General of Australia.

(To be continued.)

Extract from a recent Letter of C. F. D. PARKINSON, ESQ., *relating to the* Bunya-Bunya, *and to* Water-lilies *of* North-Eastern Australia; dated Ipswich, Moreton Bay, 25th September, 1856.

"I shall be very happy to be of assistance to the Royal Gardens of Kew if I possibly can, but I am really no botanist.

"This last season was the *Bunya-Bunya* season, but I am sorry to say I was unable to obtain a single cone.

"A gentleman sent me twelve seeds out of the cone, and when I was from home the overseer put them into the ground, where they remained for some considerable time before I knew they were there. I also obtained another seed, the contents of which I ate partly raw and partly roasted. When raw it is decidedly unpalatable, but when roasted is very good, being between a chestnut and a potato. The husk of the seed I filled with cotton and gummed together, and shall be happy to send it to be placed with the cone.

"Now as to Water-lilies. I had *one* root sent to me a distance of nearly 290 miles, with a sample of the flower, just before the beginning of winter, and was told it was different to anything of the kind growing in any other part of the district. It is a magnificent pale-blue Lily, not very much unlike what we call the Mica Lily, but larger. I put it into a water-hole in Bundanba Creek on this estate, but as yet have seen nothing of it, and very much fear that it has been destroyed by cattle trampling the hole; if so, and Sir William Hooker requires Lilies, I will endeavour to get another of the same species. It was unknown at the Botanical Gardens at Sydney. We have a great many different kinds here; the 'Mica' is generally considered the beauty, *par excellence:* it grows in all parts of the district.

"There is a Water-lily growing in a large water-hole or lagoon (in the bush, not on the road) between the stations of Wambo and Terryboo on the lower Condamine, and I have never seen or heard of another like it. The leaves are green on the top and red underneath; if I remember rightly, the stalks are reddish too; the leaves are so large that the Blacks hide under them; the flowers are very large, as large or larger than a very large saucer, and red in colour. The flowers I have not seen myself, but was informed of the size and colour by a person who had seen them several times.* There was an attack

* This is probably the *Nelumbium speciosum*, or Sacred Bean of India, known to grow in North-Eastern Australia.

made upon the Blacks near this Lily, and they took refuge under the leaves, and the white men could not get them out or get a shot at them, they were so effectually concealed.

"Sir William Hooker wishes me to procure sundry seeds or roots for him, which I think I shall be able to do. The *Bunya-Bunya* grows on the range above 'Kenilworth,' so the next season, nearly three years off, I hope to be able to supply him with some; but the Blacks do not approve of their property being too much interfered with.

"The 'Moreton Bay Pine' I can easily procure for him. And think also the seeds of the Lily that he is anxious for."

CHARACEÆ AUSTRALES; *being a Catalogue of the Species of Australian* Characeæ *which were known to* PROFESSOR BRAUN *in the year* 1854. (*Those marked with an asterisk are* Tasmanian *Species.*)

1. Nitella Stuarti*, *A. Br.*, *Linnæa*, vol. xxv. p. 704.
2. N. microphylla, *A. Br.*
3. N. glœostachys, *A. Br.*
4. N. subtilissima, *A. Br.*
5. N. Sonderi, *A. Br.*, *Linnæa*, vol. xxv. p. 704.
6. N. Gunnii*, *A. Br.*, *Linn. l. c.*
   - α, penicillata* (N. penicillata), *A. Br.*, *Hook. Journ.*
   - β, fastigiata*.
   - γ, minuta*.
7. N. biformis, *A. Br.*
8. N. Lhotzkyi, *A. Br.*
   - β, minor, *A. Br.*, *Linn. l. c.*
9. N. æmula, *A. Br.*, *Linn. l. c.*
10. N. heterophylla, *A. Br.*
11. N. congesta, *R. Br.*
12. N. gelatinosa*, *A. Br.*
    - α, genuina.
    - β, podostachya*, *A. Br.*, *Linnæa*, vol. xxv. p. 705.
    - γ, cladostachya.
    - δ, cryptostachya*.
    - ε, microcephala*, *A. Br. in Hook. Journ.*
    - ζ, polycephala, *A. Br.*, *Linn. l. c.*

13. N. leptostachya, *A. Br.*
14. N. cristata*, *A. Br. in Linn. l. c.*
    β, ambigua, *A. Br. in Linn. l. c.*
15. N. Tasmanica*, *F. Muell.; A. Br., Linn. l. c.*
16. N. diffusa*, *A. Br. in Herb. Hook.*
17. N. Hookeri, *A. Br.*
    δ, Tasmanica*, *A. Br.*
18. N. (Tolypella) antarctica, *A. Br.*
19. Chara (Lychnothamnus) macropogon, *A. Br.* var. Tasmanica*.
20. Ch. australis*, *R. Br.*
21. Ch. plebeja, *R. Br.*
22. Ch. myriophylla*, *F. Muell.; A. Br., Linn.* vol. xxv. p. 707.
    β, contexta*, *A. Br. in Herb. Hook.*
23. Ch. mollusca*, *A. Br. in Herb. Hook.*
24. Ch. Leptopitys*, *A. Br. in Herb. Hook.*
25. Ch. Hookeri*, *A. Br.*
26. Ch. Gymopitys*, *A. Br. in Linn.*, vol. xxv. p. 708.
27. Ch. Preissii, *A. Br.*
28. Ch. Drummondii, *A. Br.*
29. Ch. scoparia, β, Muelleri, *A. Br. in Linn. l. c.* (inconspicua, *F. Muell.*)
30. Ch. fœtida, *A. Br.*
31. Ch. contraria, *A. Br.*, v. australis, *A. Br., Linn. l. c.*
    var. Behriana, *A. Br., Linn. l. c.*
32. Ch. fragilis*, *Desv.*, var.

On Pteris aquilina *as an* Esculent Vegetable; *by* Benjamin Clarke, F.L.S., etc.

Dr. J. D. Hooker having incidentally suggested some time since that the British *Pteris aquilina* and the New Zealand *P. esculenta* were varieties of the same species, and the Rev. M. J. Berkeley having shown that the rhizome of the former was also esculent, so far as not to disagree with the latter in that respect, I have been induced to carry the inquiry one step further, viz. to endeavour to ascertain whether or no the young fronds of the British Fern, when in a very early stage of growth, might not prove useful as an esculent vegetable, in the same way as the young shoots of Asparagus or of other vegetables, when blanched.

This question may deserve especial attention, because the properties of Ferns (and they appear, from the accounts given of their medical uses, all to possess more or less the same qualities) are tonic, antibilious, and decidedly deobstruent; and therefore a Fern, if esculent, might be expected to be very serviceable as a change of diet to those labouring under dyspepsia and its consequences. And as we have no Fern, or other allied plants, in use as articles of food, an esculent vegetable taken from a class of plants so widely different from all those at present cultivated, might be expected to be not without its advantages.

The result of the inquiry, which has now extended to six weeks, is entirely in the affirmative, as far as that the young fronds, when completely blanched, are an agreeable esculent vegetable, parcels of them having been sent as a new unnamed vegetable to parties who have, all of them, in return sent written acknowledgments to that effect, stating also that it was equal or superior to others named by them.

The young fronds should be cut as soon as they first begin to appear at the surface of the ground, and as low down as may be; and when quite blanched, boiled for one hour; but if tinged with green, for an hour and a quarter, or an hour and a half, the leafy part in the latter instance being rejected; a quantity of salt being added to the water, sufficient to give the vegetable a slightly saline flavour.

They however retain, when at all green, a somewhat harsh herbaceous flavour, not unlike that of tea, which requires some such sauces as are used with Asparagus, to give them a palatable flavour. But this may be expected to disappear if the plant is cultivated, or even partially cultivated, in its native place of growth, as in some fronds which had become completely blanched through sand having been thrown over a mass of the plant, it was scarcely or not at all perceptible, although they had become six or eight inches in height. The vegetable in this condition was considered preferable to garden Spinach, and also to have a more beneficial effect on the digestive organs.

BOTANICAL INFORMATION.

British North-American Exploring Expedition.

Under the head of 'Scientific Exploring Expeditions of the British Government,' at p. 101 of this volume, was announced the intention

of the First Secretary of State for the Colonies, of sending a scientific party, under the command of J. Palliser, Esq., into those almost unknown regions of the southern portion of the British possessions of North America, in part occupied by the Rocky Mountains, north of the 49th degree of latitude. The arrival of the officers at New York has been announced; but, though so late as May 29th, the Lakes Superior and Winipeg, which they would cross on their journey westward, were recently so obstructed by ice, that the steamboat had not been able to ply on the latter waters; so that in reality no available time had been lost by the delay occasioned by the illness of Mr. Palliser at the intended time of his departure from England. On the present occasion we are desirous of laying before our readers a copy of the instructions supplied to the Botanical Collector, M. Bourgeau. They have been drawn up with much care, and may, with certain modifications, according to circumstances, perhaps serve as a model for similar Instructions on future occasions. They are as follows:—

INSTRUCTIONS FOR M. BOURGEAU.

M. Bourgeau having been engaged by the Colonial Department of the British Government in the capacity of Botanical Collector, to accompany an Expedition for scientific research into the interior of British North America, under the command of John Palliser, Esq., for a period of two years or thereabouts—he is to consider himself to be at all times under the authority of that officer, to be obedient to his instructions in every particular, and is required to make over all the collections to Mr. Palliser, as the commanding officer on behalf of the British Government.

M. Bourgeau being familiar with the best method of collecting and preserving plants on an extensive scale, it is not deemed necessary to proffer any particular directions on that point. He is to lose no opportunity of making as perfect a collection of the plants of the regions he passes through as possible, whether in the United States (especially in the less frequented districts, such as the upper branches of the Missouri) or in British America, neglecting no species of plant, and preserving specimens of every kind, more especially such as seem to be confined to certain localities. The arborescent plants—trees of every description, are to be sought for and collected in flower and in fruit: the cones and larger acorns, and other kinds, too large for the

hortus siccus, to be preserved apart from the foliage, and notes made of the locality, height, bulk of the trunk, etc.

In proportion as the mountains are ascended, the vegetation will be found to change, and to become more interesting and more peculiar; and it is hoped that the Commander will permit as full and extensive collections as practicable to be made of the *alpine* vegetation.

Particular notice should be taken of those plants which are found nearest to the limits of perpetual snow.

In journeying through the country, the utmost care must be taken to preserve the collections from wet and damp, especially when passing rivers, in rainy weather, and from the effects of a moist atmosphere. Indiarubber calico will be provided; but it will often happen that the collections will have to be opened and exposed to a dry air, or to artificial heat.

In the matter of *living Plants* for the garden, the difficulty of transport is too great to render sending them practicable, except in the case of *Bulbs* and *Tubers*, young plants of Cactuses, etc.; but *seeds* should be extensively collected of all kinds; and the mode of preserving such is explained in the accompanying Instructions (addressed to M. Bourgeau).

Objects for the Museum of Economic Botany should occupy M. Bourgeau's attention and inquiry. In a general way these are noticed in the above-mentioned printed form of Instructions. They consist of whatever is *curious* and whatever is *useful* to *mankind* of *Vegetable Origin*. They consequently include a great variety of articles of *Food*, *Clothing*, *Ornament*, *Medicines*, *Resins*, *Dye-stuffs*, samples of *Woods*, particularly those good for *carpentry* and *cabinet-work*.

Woods are made into bows and implements of different kinds, and it is important to obtain these and attach to them the names of the plants from which they are derived, or to obtain specimens of the *plant*, and attach the same number as to the *product*.

The following are some among the known products which should be collected for the Museum. *Spaetlum* of the natives, the dried and edible roots of *Lewisia rediviva*, together with the bags in which they carry them. *Camash* or *Kamass*, the esculent dried roots of *Camassia esculenta*. *Dried Cakes* of the berries of *Gaultheria Shallon* (N. W. America). *Matting* and *Basket*-work made of a very *frequent* grass or grass-like plant, together with the plant of which it is made. Objects

made of the leaves of an Iris, *Iris tenax*. Bread of some kind of bark (N. W. America) formed into large cakes and dried in the sun: supposed to be made from a *Betula*. A great deal of *ornamental* work is made by the Indians of the wood and bark and fibres of various trees and plants: these should be procured, and the plants ascertained from which the substance is derived. Attention should also be paid to every new object not yet known as the product of the country.

Mr. Palliser will kindly assist in the forwarding, perhaps through the Hudson's Bay Company's officers, whenever occasion presents itself, seeds and roots, and such collections as it may be desirable to transmit to England before the return of the Expedition.

W. J. HOOKER,
Director of the Royal Gardens, Kew.

Upon the present occasion, in compliance with the request of the Committee of the Royal Society appointed to draw up instructions for the guidance of the officers of Mr. Palliser's Expedition, the following additional ones have been appended to those already communicated to the Colonial Office by Sir W. J. Hooker, and addressed to the Botanical Collector. Most of the subjects to which they refer fall immediately within the province of the Botanical Collector, and require from him nothing beyond attentive observation during the operation of collecting, with the proper performance of which duty they are on no account to interfere; others, again, demand some special attention, as well as the assistance of those officers who are more especially charged with the Meteorological Observations, and these are generally required at periods when extensive collections cannot be made.

I. Varieties and abnormal forms of species should be sought for and preserved; and too much attention cannot be devoted to noting differences in habit, and obtaining the different forms of leaf, flower, etc., that the same species produces at different periods of its growth, and under different conditions of growth. When several specimens are taken from an individual, these should be from different parts of it, and, whenever possible, specimens from several individuals should be preserved. Abnormal forms, produced by the grazing of animals, puncture of insects, and other accidental causes, should be collected, and every endeavour used to trace the extent to which species vary, and the causes of these variations.

II. Natural hybrids should be sought for, especially amongst diœcious plants; and where diœcious plants are gregarious, the average proportion of males to females should be attended to. Instances should be searched for of unisexual plants ripening their seed abundantly where the male individuals are rare or not found.

III. The Botanical Collector should endeavour to ascertain the number of species growing in small areas (1–10 square yards) in localities which are either particularly rich or poor in species, with the view of ascertaining what relations may be traced between elevation, soil, climate, etc., and the influence these conditions have upon vegetation. It would, for instance, be of the greatest interest in these respects to compare—

The Prairie, Swamp, and Forest Floras.

The Floras of the Plains near and far from the base of the Rocky or other mountains, and of elevations of 4000, 8000, and 10,000 feet, etc.

The Floras of the Eastern and Western declivities of mountains.

The Floras of Granite districts, with those of Limestone and other formations.

During short halts, approximate estimates of the number of species occurring on swards, etc., may be taken in a very short period, and should be noted down, and a number of such approximations is of more value than a very few absolutely accurate lists, the disturbing influences being very many and great.

IV. In spring, the Collector should observe the times of leafing and flowering, etc. of bushes and trees, and of the germination of seeds (specimens of germinating seeds should be preserved, especially such as present much variation in their cotyledonary leaves), and whether these phenomena are rapidly or slowly developed over considerable areas, and in what plants it progresses with most uniformity, etc. Where the vegetation appears to be unusually retarded or accelerated, the temperature of the surface-soil, and at three feet depth, should be ascertained whenever possible.

V. As far as possible the collector should make himself acquainted with the names of the more common and conspicuous plants of the districts he traverses, by means of Professor Asa Gray's 'Botany of the Northern United States,' and of their ranges, etc., as indicated in the Appendix to Sir J. Richardson's 'Boat-Voyage through Rupert's

Land:' a little knowledge of this kind will enable him to collect to more advantage, and make fuller and more accurate notes of distribution, etc.

VI. All possible means by which seeds are transported should be observed: the stomachs of birds and fish, and the pellets disgorged by hawks, owls, etc., examined; the mud on the feet of swimming and wading birds dissolved and searched; the shaggy furs of animals, and even the cleft hoofs of ruminants, are often agents of transport over extensive areas. During the season of migration of the animals, these observations should be pursued with greater energy.

VII. All indications of plants affecting waysides, the tracks of men or animals, Indian encampments, etc., should be noted, and the effects of clearing away forests, burning grass-land, etc., especially attended to.

VIII. Great care should be taken so to ticket the specimens that in case of any accident to the Collector, there may be no difficulty in determining their localities, etc. If numbers, contractions, or private marks are used on the tickets, these must always be accompanied with the name of the district in which the plant was gathered, the date, elevation (if above 2000 feet of the sea-level), etc. It is impossible to give any general instructions as to the amount of information that should accompany the specimens, but as a general rule it is recommended that as far as possible the notes should be attached to the specimens to which they refer. From neglect of this precaution many valuable collections of plants and of observations have been rendered useless.

IX. Thermometers and tubes will be supplied to the Expedition for taking the temperatures of various bodies and of the soil at three feet depth. It is very desirable that the temperature to which great heat and cold penetrate the trunks of evergreen and deciduous trees, and the soil near their roots, should be ascertained.

In the case of trees, auger-holes should be bored obliquely to the centre of the trunk, and two thermometers attached to a rod of wood (one at the base and the other halfway up) inserted in the hole. The thermometers should have both bulb and stem (except where the scale must be visible) padded with cotton, and the auger-hole should be loosely filled with sawdust, or other non-conducting material, and plugged at the orifice.

The temperature of the earth at three feet depth may be obtained with sufficient accuracy for botanical purposes by sinking a brass tube of that length in the exposed soil and placing in it a thermometer,

attached to a rod of wood, and padded as above; a sod should be placed over the top of the tube, and the thermometer examined night and morning. (I rarely in India found any difficulty in sinking a thermeter thus, at every encampment, though where the soil is very hard it may not be possible to reach a greater depth than 1–2 feet.) If the thermometers used as above are properly padded with cotton, it will be found that their temperature will not, under ordinary circumstances, alter for several minutes after they are withdrawn from the auger-hole or tube.

X. Observations are much wanted on the temperature of the soil at various depths beneath the snow during winter; and on the temperature of the air and water between the under surface of melting snow-beds, and the subjacent dormant vegetation, with the view of determining the causes of the rapidity with which plants germinate and blossom after the disappearance of the snow from alpine situations.

JOS. D. HOOKER,

May 2, 1857. *Assistant Director, Royal Gardens, Kew.*

NOTICES OF BOOKS.

An Introduction to Cryptogamic Botany; by the REV. M. J. BERKELEY, F.L.S. With 127 Illustrations on wood, drawn by the Author.

Upwards of a century has now elapsed since Introductions to Botany first appeared in a scientific form. In this, as in all other modes of methodizing the study of plants, Linnæus successfully led the way; and of all his followers, those have made the greatest progress and advanced the study most who, having caught the spirit of the author of the 'Philosophia Botanica,' observe and study well, reason cautiously, and rarely let their pens far outstep the limits of their own experience. Of the numberless Introductions to Botany which crowd our library-shelves, how few are ever consulted! scarcely a dozen rank higher than more or less complete or skilful compilations; and amongst those which bear evidence of the author's having patiently exhausted all the attainable means of verifying his statements, few indeed show any amount of originality, critical inquiry, aptitude for correlating facts and deducing general laws, prescience of future discoveries, indications of researches to be pursued that may open up the path to these, or warnings against confounding realities with appearances. For the most part they consist of a *résumé* of many of the facts and many of the fables that have

been accumulated under the leading ideas conceived by Linnæus, De Candolle, and others, and present a compromise between a series of aphorisms to be crammed by a student, and a treatise on botany which may be read either piecemeal to a class as a lecture, or at home instead of a lecture. Few tell the student of the broad principles upon which he is to ground his studies, or lead him to think for himself; and some of them abound in errors of detail, in loose and inaccurate expressions, and in unphilosophical ideas.

Amongst the most remarkable exceptions to this prevalent type of Introductions to Botany are,—in France, De Candolle's numerous works, and A. de Jussieu's 'Cours Elémentaire;' in Germany, Link's 'Elementa Philosophiæ Botanicæ' and Schleiden's 'Principles;' and in our own country, Lindley's 'Introduction to the Natural Orders,' his 'Vegetable Kingdom,' and Henfrey's 'Outlines of Structural and Physiological Botany;'—all which works bear evidence of the authors having observed and thought for themselves, and taken little for granted that was capable of verification. In the same high rank with these, Mr. Berkeley's 'Introduction to Cryptogamic Botany' will take its place; whilst in point of originality and amount of independent research it has few, if any, rivals in the wide field of botanical literature to which, as an introductory work, it belongs.

The necessity for a really sound and comprehensive work on Cryptogamic Botany has long been felt in this country, nor has its place been well filled in any other, for the best of the foreign ones are for the most part little better than compilations, undertaken by persons whose knowledge is confined either to systematic Cryptogamy and the classificatory branch of the science, or exclusively to the leading features in the morphology and history of development of the various natural orders of flowerless plants. It is not too much to say that Mr. Berkeley is the only botanist in Europe who to an accurate and comprehensive knowledge of the orders, genera, and species of Thallogens, their structure, development, and distribution, adds a general sound acquaintance with all other departments of Cryptogamy, and has further made an intimate study of the minute anatomy, physiology, morphology, and diseases of flowering plants. Add to this, that he possesses an excellent library and herbarium, that his experience ranges over upwards of forty years of continuous study, that he is a scholar, well read in the literature of his science, and it follows that he is of all men the best qualified for the task he has now so ably fulfilled. That his great

merits should be so little known in this country is not to be wondered at, considering how few even of the professed Cryptogamists of the day appreciate that accurate acquaintance with the details of botanical science upon which a reputation must be founded if it is to be enduring; but it is even more wonderful that, in an age which boasts so much of a just and generous appreciation of advances in economic science, the first public acknowledgment of Mr. Berkeley's services in explaining the diseases, and proposing practical methods for checking them, in the cases of the Vine, the Hop, and the Potato, should come from a foreign Power.*

It is beyond our province to introduce lengthy quotations by which the merits of a work may be more or less well judged of; but there are some points discussed in Mr. Berkeley's work, of so high a general interest in botany, and which appear to us to be so ably and philosophically treated, that we cannot omit pressing them upon the attention of all classes of botanists, and many of them indeed upon naturalists of every degree. In such points the Preliminary Observations abound; thus in the second page we find evidence of the author having studied the difficult subject of the anatomy of *Nymphæaceæ*, and the relative value of Dictyogens, Rhizogens, and Gymnogens as natural groups. The details of the minute anatomy of Cryptogams are illustrated by analogous structures in flowering plants, and their modes of development compared with great skill and judgment. A long article is introduced on the real or supposed coincidences in the structure and development of the pollen-grains, spores, and antherozoids on the one hand, and on the other of the ovules, embryo and embryonal sac, and vesicles, with the various modifications of the germ-cell in the higher Cryptogams. After a full and accurate *résumé* of the chief facts in either case, Mr. Berkeley arrives at the conclusion, that the coincidences of structure are apparent, and not real, and that those of development are reducible to a higher law, which correlates all the facts of embryology, or rather sexuality, and not to a special law that would ally Conifers more closely with Lycopods than with Dicotyledons, or place Lycopods in the series of Phænogamic plants.

Throughout the work similar discussions are abundantly interspersed,

* Whilst penning this notice, the information has reached us that the French Government has awarded Mr. Berkeley a honorarium of 500 francs for his labours on the nature and cure of the Vine-disease. We believe that this was a wholly spontaneous act on the part of our allies, and that it is no less an agreeable surprise to Mr. Berkeley than to all his English friends.

the object of the author being especially to guard the student against confounding analogy with affinity, and homology with analogy. Much curious matter on the subject of life, irritability, powers of selection and rejection displayed by animals and vegetables, Cryptogamic and Phænogamic, are profusely introduced. The uses and abuses of *Fungi*, etc., as articles of food or luxury, are fully detailed; remedies for diseases of plants are given; monsters, anomalies, paradoxes, curious instances of deceptive appearances, and their results on the progress of science, are all noticed, and cautions to young microscopists deduced from the effects of hasty observations. The general remarks upon Ferns will have a wide-spread interest now that these beautiful plants are as commonly cared for as coins, seals, and shells are and have been for many years past. But to give any idea of the mass of matter or extent of original observation displayed in Mr. Berkeley's book is wholly beyond our power: in our opinion it exhibits a wider and more varied range of *personal observation* than any botanical work of the present century, and its general excellence is quite in keeping with its merit in this respect.

The work is well but not profusely illustrated with woodcuts, and it is no little addition to Mr. Berkeley's accomplishments that these have all been drawn on wood by himself, and are, almost without exception, from original dissections; though neither so numerous nor so well-executed as the book deserves, they are all useful and accurate. In these days of exquisite wood-engraving, they will disappoint many; but for our own part we prefer these honest pictures of the mutilated structures that the microscope presents, to the beautiful lace-like tissues and mathematically-drawn cells, tubes, and networks, which we often see projected over many square inches of paper,—claiming for the subject, dissector, and artist a degree of accuracy, beauty, and skill, to which the artist alone has any just claim in reality.

The defects of Mr. Berkeley's work chiefly lie in the details of execution, and, in some degree, in the arrangement; the general matter reads too much like a diffuse discourse upon certain matters connected with the study of Cryptogamic Botany; and the different branches of the subjects are not so well arranged or skilfully subordinated as they might have been; this leads to some confusion and repetition, always however of important matter which we do not grudge to read again. The author is further apt to forget that he has no reader in England who is his equal in knowledge of his subject; comparisons of great truth, and

often of equal force and originality, are made between species, genera, or other groups, of different families, but from want of any hints as to what the families are to which the genera belong, it is sometimes impossible to understand them. The same disregard of the reader's inferiority in point of practical acquaintance with the subject is displayed in alluding to authors, and more frequently to countries; the names of local writers, and of small, little-known parts of the globe, are repeatedly introduced without any indication of who the one is or where the others are; and a long train of reasoning is thus sometimes lost to the most attentive reader, and thrown away upon less intelligent ones. Lastly, the absence of any table of the contents, of compendious analyses of the chapters, of descriptive headings to the pages, of a key to the general arrangement of the matter, of a synopsis and diagrams of the principal families and tribes, and of a fuller Index, are serious drawbacks to the utility of the work. These are points whch may be easily remedied in a second edition, and this we hope and believe will be very soon called for,—when too a chapter on the methods of observing and collecting, of depicting and studying, and of preparing and illustrating, an herbarium of Cryptogamic plants, might be added with the greatest benefit, as would also separate chapters on the phenomena of life, and principles of classification, etc. The work is eminently profound, original, philosophical, and accurate. In the Preface it is honestly stated, that it is not intended for persons who have not some general acquaintance with botany; but the above are drawbacks felt by professed botanists, and which, if remedied, would render the work exceedingly useful to those having no general acquaintance with botany, and not one whit less valuable to the experienced botanist, but the contrary.

BENTHAM, G.; PLANTÆ HARTWEGIANÆ. 8vo. 1 vol. 393 pp. 1839–1856. London: Pamplin.

Mr. Bentham's 'Plantæ Hartwegianæ' is now completed, and on sale at Mr. Pamplin's, 45, Frith Street. [Any persons having received presentation copies from Mr. Bentham may have them completed on applying to him at 91, Victoria Street, Westminster, stating the last page which they have received from him. He will then (immediately on his return from the Continent, in October) forward the remaining sheets.]

Our valued friend Mr. Bentham has done good service to the cause of the Botany of Central America, in the publication of this valuable

work, which bears the title of '*Plantas Hartwegianas imprimis Mexicanas adjectis nonnullis Grahamianis enumerat novasque describit Georgius Bentham.*' It is now complete, occupying nearly 400 closely printed pages, including the very perfect Index. Although the Title-page bears the date of 1839, it was not concluded till 1856. 2230 species are enumerated; these are the results of the researches of Mr. Theodor Hartweg, Collector for the Horticultural Society of London, who commenced his journeyings in 1836. His dried specimens were on sale, sent home at different periods with numbers attached to them, and all these, to the great advantage of the public, Mr. Bentham undertook to name and distribute for the benefit of the collector.

1. The first set sent home, No. 1–258, were collected in the country north of the City of Mexico in 1837.

2. No. 259–443, apparently from the same region, collected in 1838.

3. No. 443–552, are from the territory of Oaxaca, and towards Vera Cruz.

4. No. 523–631, from Guatemala.

5. No. 632–707, from Columbia, near Guayaquil.

6. No. 708–869, from Loxa, Columbia.

7. No. 870–1531, from the Magdalena and the Andes of Quito, Popayan, and Bogotá. All those from Columbia were collected between 1841 and 1843.

8. No. 1544–1589, from Jamaica. (The plants of Columbia and Jamaica are followed by a systematic enumeration of the both.)

9. No. 1590–1624. These form part of the Mexican collections which were gathered in 1836, and accidentally omitted.

10. The last, and not the least interesting portion of this fine Hartwegian set, including No. 1625–2042, were collected in California, during the years 1846–7, chiefly about Monterey and Sacramento; and we scarcely know which to admire most, the ardent zeal of Mr. Hartweg in forming such extensive collections in such varied regions, or the botanical skill of Mr. Bentham in thus enumerating and describing them.

It will be seen that the numbering of the specimens (2042), do not correspond with the "species enumerated" (2230), which is accounted for by the fact that, in the Collection, species are, from different localities, occasionally numbered more than once; and on the other hand, a great many species are added (without numbers) from species which were too few for distribution.

Notes made during the recent Expedition across the NORTHERN PORTION *of* AUSTRALIA, *under the command of* Mr. Surveyor Gregory; *by* DR. F. MUELLER, Colonial Botanist of Melbourne, and Botanist to the Expedition.

(*Continued from p.* 199.)

Buettneriaceæ of the latter part of the Expedition contain only a new pink-flowering genus, allied to *Waltheria*, characterized principally by monœcious flowers, and a fruit consisting of two carpels (hence *Dicarpidium monoicum*); it is rare enough on the sandstone table-land of the Gulf of Carpentaria.

The beautiful genus *Cochlospermum* becomes increased by a tree of much greater dimensions than *Cochlospermum heteroneurum* (*C. Frazeri?*), of the Victoria River, producing digitate leaves. It is very distinct from *C. Gossypium*, according to the figure in your Miscellany.

Malvaceæ.—The greater part of the *Hibisci* of this Expedition belongs to the section *Ketmia*, to which I am obliged to refer also the Australian *Fugosia*, noticed in Sir T. Mitchell's last work, page 387, although we may possess that genus, perhaps, in *Hibiscus Huegelii*, Endl., from West Australia. *Hibiscus Trionum* is very common on basaltic plains in the interior. The eight species of this collection are all carefully described from a suite of living specimens; form and colour of petals, the columna, the disposition of the filaments, etc., affording as many beautiful characters for distinction of the numerous species of this genus; but all these marks are generally lost in drying the plants. One may be transferred, when fruit shall be obtained, to *Abelmoschus*, although very distinct from *A. albo-rubens*, which extends as far as Peak Range; but *Hibiscus splendens*, belonging to the section *Ketmia*, can never be removed from the genus, as done by various writers. I send the description of eight *Sidæ* and *Abutilons*, and have to add to the number of these and of *Hibiscus* as soon as I receive my other notes. The rest of *Thalamifloræ* shows little of interest, perhaps *Byblis cærulea* excepted.

Myrtaceæ form, I think, the most important part of my herbarium. After watching the *Eucalypti* of tropical Australia, day after day, for nearly sixteen months, I can confidently hope that in my interpretation of the species, I have not much erred from the truth; and that the two new systems of these trees, which I beg to recommend to your

further consideration, are based upon sound principles. You will observe that I have, of thirty-four species, given the characteristic of the bark, and of the greater part a full diagnosis; in several cases additional information will be gained from my other notes, and the species will, from the unarrived collection, be increased to about forty; of these are only two fruticose, and a considerable number produces opposite leaves; in the colonies of Victoria and South Australia, on the contrary, scarcely a single one belongs to opposite-leaved species, whilst numerous kinds are not growing beyond the size of shrubs. For the use of the colonists the bark will always afford the best mark of distinction; trees, at times, may be distinguished of various kinds, so far as it is necessary for a traveller, or the practical use of the settler, in telescopical distances; nor can the monographer of these plants dispense with the knowledge of those characters which I pointed out in my cortical system; and, as proof of this, I may state that I should, from herbarium specimens alone, unhesitatingly pronounce the Silver-leaved Iron-bark, the Silver-leaved Box-tree, and one of the Bathurst Stringy-bark-trees, as identical! or rather, as insignificant varieties of the same species; and yet nothing can be more striking than the difference in texture and structure of the bark of these three species, characters which of course do not admit of vacillations. This is however not the place to enter upon my investigations of these interesting trees, on which I hope to throw more light in a separate memoir. But you will observe that the five sections, *Leiophloiæ*, *Hemiphloiæ*, *Rhytiphloiæ*, *Pachyphloiæ*, *Schizophloiæ*, exhibit trees which, as Flooded Gum-trees, as Iron-bark-trees, Stringy-bark-trees, etc., belong to so many respective sections, and that the trees, as such, are familiar to the colonists. Thus, for instance, at least six Stringy-bark-trees exist, very distinct as species, which however always will pass under this collective name by the settlers. The sixth section, "*Lepidophloiæ*," is quite a botanical novelty; it includes those *Eucalypti* which, technically, I would call *Mica*-trees, remarkable for a lamellar, brittle bark, much resembling mica schist. The *Melaleuca* Gum-tree of Leichhardt, and *E. melissiodora* of Ldl., belong to this group. The appliance of a cortical system for the determination of herbarium species, being generally impracticable, I have added a clavis, in which I employed for the above-mentioned species, after having them divided into sections somewhat similar to those of former botanists, an arrangement according to

the insertion of the valves of the capsule, a character which I found by far more constant than the relative length of operculum and tube of the calyx. Of the thirty-four species of this collection I have only identified five as known with certainty, and only one (*E. rostrata*), or perhaps two more, as inhabitants of South Australia and Victoria. Should you, Sir William, attach the same importance to this part of my labours, with which I improperly, perhaps, regarded it, I should be very glad indeed to see those species soon appear before the botanical public.

The rest of *Myrtaceæ*, containing diagnoses of three new genera and twenty-four species, are not devoid of interest:—four species of *Calycothrix* (in the collection already packed at the time of writing these pages, I employed two specific names, identical with Meisner's of West Australia, lately introduced; in the manuscript I have altered these); one of them arborescent, another passing nearly into *Lhotzkya*. *Homalocalyx* is a new genus, intermediate between *Tryptomene* and *Paryphanta*, established upon a very local plant. Of the former (*Tryptomene*) a pentandrous species was observed in East Tropical Australia. Of *Harmogia* I have two additional; and it is singular that I should have fallen into the same error with *H. virgata*, after I had, years ago, in transmitted manuscripts, referred the *Camphoromyrtus Behrii*, Sehl., to *Harmogia affinis*, Schauer; however, the two genera differ but slightly in the structure of their anthers. *Astartea*, one species, characterized by the absence of a true pedicel. *Callistemon* requires a new study. My *Callistemon arborescens*, mentioned in 1852, in the 'Linnæa,' is *C. brachyandrus*, Ldl., a plant at the time unknown to me. Amongst Mitchell's plants I notice a gorgeous species, which seems to be very distinct, having nearly persistent bracts. It is the most robust of all, and I send notes on it and two others. *Melaleuca* contains, this time, only two new kinds, both referable to *Asteromyrtus*, if this genus should be kept. To *Tristania* I reduce again *Lophostemon* and *Syncarpia*.

The *Angophoræ* are as well marked in decortication as in structure and texture of bark as *Eucalypti*, and I have thus been compelled to increase the species to six. *Eugenia* received three additions at least to Australian species, one being a charming tree, with rich umbels. Another fine timber-tree, *Lysicarpus*, is also generically distinct from *Metrosideros* and *Pericolymma*, in its dimorphous anthers; those of the

outer series being sterile and the largest; the cells of the capsule seem always one-seeded, with a wing round the seed; the leaves are ternate and linear. Another new genus, *Lithomyrtus*, MSS., differs from *Psidium* in a dry berry and a circinate embryo. An undescribed *Disemma* differs from the rest in five- (not ten-) cleft calyx, and in the extremely short corona. It is a rare climber of the Burdikin-banks.

Amongst *Cucurbitaceæ*, which I fortunately have been able to examine in a recent state, I established a new genus, *Cucurbitella*, seemingly next to *Sicydium;* added a *Luffa*, from which the Victoria River species differs in forming five sacculate protrusions at the base of the calyx, and in prickly-tubercled fruits; two species of *Trichosanthus*, having none of that disagreeable odour which marks the otherwise splendid species from North-west Australia; and *Bryonia laciniosa?* or an allied species, but different from *B. affinis*, Endl., from Norfolk Island, so that we are now acquainted with twelve species of this Order from Australia, of which none are found in West Australia.

Rosaceæ do not exist beyond the Tropic of Capricorn in Australia; but on the east coast I have obtained, through Mr. Moore, a diœcious *Rubus*, like *R. australis*, from which it differs principally in ovate bracts, and stamens shorter than the calyx; and a second unknown kind, discovered by Mr. Hill, closely allied to *R. Lambertianus.* Of *Bauera* nothing exists in the north, but I re-examined such materials as the public collection of Sydney afforded me, and feel inclined to retain *B. microphylla*, Sieb., and *B. capitata*, Ser., as distinct from *B. rubioides.* I believe also that *B. Billardieri* must be confirmed as a species, but I had not a single specimen at hand for comparison, the species being seemingly restricted to Tasmania and Victoria. But although the distinctions drawn between these four species (in this instance principally upon the form of the anthers), admit of doubt, still there can be only one opinion on the stability of the characters of *B. sessiliflora*, as pointed out in the Victoria Philosophical Transactions; indeed it is with scruples that I retain this plant in the genus at all, since the ovary is totally enclosed in the tube of the calyx, one-celled, biovulate, with pendulous ovules, one only fertilized, and I little doubt that the capsule, which I have not seen ripe, will dehisce only unilaterally, since there is only a suture on one side of the ovary. Thus *Bauera sessiliflora* brings its genus into close contact with *Ceratopetalum. Bauera sessiliflora* is the most western species of the genus (not

a single Cunoniaceous plant existing, to my knowledge, in South Australia, and, except *Eremosyne*, in West Australia), is further limited to one single system of mountains. It will be no doubt hardy in England, as it grows on the subalpine summit of Mount William in great luxuriance, and I have been always proud of this new commemoration of the memory of the two Bauers, so that I hope, Sir William, you will oblige me in giving publicity to that portion of my manuscript (sent this time), in order to restore it to its honour again.

The fine *Carallia*-tree seems to be well marked from the Indian species, and is the only new contribution to *Rhizophoreæ* gained by this Expedition, being also seemingly very rare. That *Ceriops*, *Bruguiera*, and *Rhizophora* occur I have mentioned previously.

On *Compositæ* I have only commenced to work, but transmit now a paper on two new genera allied to *Pluchea*.

Umbelliferæ become gradually a large Order in this part of the world, particularly if we adnumerate Dr. Hooker's interesting contributions from Tasmania. The North-Australian Expedition has yielded the remarkable genus *Hemicarpus*, with three species, the teeth of the obliterated mericarp of *H. glandulosus* being much shorter than in the two other species, which requires a slight modification of my first outline of the genus, although it is otherwise not infringed, but rather confirmed by the third species. *Didiscus* takes its place at Moreton Bay, where a sixth species (*D. procumbens*) occurs. But another new genus has been obtained, of which you find a description as *Platycarpidium*; it is a tall bush, often twelve feet high, with polygamous flowers, nearest related to *Platysace*. Only one of the six tropical or subtropical species of *Hydrocotyle* seems unknown. The gigantic herb of this Order, seen by Cunningham, we have not met with.

If you can find, Sir William, an empty corner in your Journal for the magnificent new *Panax* from Moreton Bay, which, on account of *racemose*, not umbellate inflorescence, is very singular, I think this plant will well deserve the place; I call it *P. polybotryus*, and it flourishes in the greatest profusion in the Sydney Garden. I saw it myself in the wilderness, but not the *Panax?* allied to *P. arborescens* and *P. Colensoi*, found by Mr. Moore at Wide Bay. Could the latter be Leichhardt's *Sciadophyllum?*

Of *Leguminosæ* I send this time only the two descriptions which establish the new genera *Brewsteria* and *Plagiotropis*. The former is

distinct from *Cassia* in producing in the middle of the lower stamens a large globular nodus, and in lower anthers not only opening half-lengthwise, but also with a large basal foramen. This is one of the most charming trees I ever beheld, and well worthy to bear the name of the great and venerable natural philosopher, Sir David Brewster.

Plagiotropis recedes principally from *Vigna* in the paradoxical structure of its carina, which is repressed laterally, that side which thus becomes the front of it, protruding into a long, hollow cone. Specimens will come in the next sending, but I add to this parcel a specimen of *Brewsteria*, for kind inspection of yourself, Dr. Hooker, or Mr. Bentham.

NORTH-AUSTRALIAN EXPLORING EXPEDITION; *Letter from* A. C. GREGORY, ESQ., *Commander of the Expedition.*

(*Continued from p.* 209.)

[Second Letter of Mr. Gregory (alluded to at p. 201) to the Governor-General of Australia, dated—]

Burnett District, 2nd December, 1856.

Sir,—I have the honour to inform you of the arrival of the North-Australian Expedition within the limits of the settled parts of New South Wales, and transmit, for the information of his Excellency the Governor-General, a brief outline of the proceedings of the Expedition.

From the time of landing the horses at Point Pearce, in September 1855, to the 9th of May, 1856, the party was employed in preliminary details, and the exploration of the country to the south of the Victoria River, having penetrated the interior desert to latitude 18° 20′ south, in longitude 127° 30′ east, a detail of which I forwarded by the 'Tom Tough' schooner, *viâ* Coepang, and which doubtless has already come to hand.

The schooner 'Tom Tough' having been seriously damaged in ascending the Victoria River, and a quantity of stores and provisions thereby destroyed, I instructed Mr. Baines to embark that portion of the Expedition which was not required to form the land party, and proceed to Coepang for supplies, and thence to the Albert River, in the Gulf of Carpentaria, to co-operate with the land expedition.

On the 21st of June I left the encampment on the Victoria River,

with a party of six persons, viz. Mr. H. Gregory, Mr. Elsey, Dr. Mueller, and three men, Dean, Bowman, and Melville.

The arid nature of the country in the interior of Northern Australia compelled us to decrease our latitude to 15° south, in order to pass the central parts of Arnheim Land; after which we kept parallel to the coast, as far inland as water could be found in the rivers, the greatest distance from the sea not exceeding one hundred miles.

Reaching the appointed rendezvous at the Albert River on the 30th of August, the schooner had not arrived; but from some marked trees it appeared that her Majesty's ship 'Torch' had sent a boat up the river a few weeks previous, but it was evident that this visit had no reference to the Expedition, as the only marks left consisted of the names of some of the crew, which they had amused themselves by carving on the trees and stumps, and the ashes of their fire.

Under these circumstances I deemed it advisable not to await the arrival of the schooner; and having marked trees, and buried instructions for Mr. Baines at a spot which had been previously agreed upon, we left the Albert on the 3rd of September, and made some ineffectual attempts to proceed to the south-east, but want of water compelled me to pursue a route parallel to the coast, to latitude 17° 20′ south, when the Gilbert River enabled a south-east course to be again pursued.

Crossing the heads of the Lynd in 18° 40′, reached the Burdekin on the 16th of October; our route was then along the right bank of that river, to the junction of the Suttor River, which was followed up to the Belyards River; tracing that river to latitude 22°, and then a south-east course to the junction of the Comet and Mackenzie Rivers, and thence an easterly course to the Dawson, brought us to Messrs. Conner and Pitt's station on the 22nd of November.

I am now *en route* to Brisbane, where I purpose to leave the horses until arrangements can be made for their disposal, and proceed direct to Sydney. I have, etc.,

A. C. Gregory,
Commander N. A. Expedition.

[Third Letter from Mr. Gregory.]

Sydney, 7th January, 1857.

Sir,—I have the honour to transmit, for the information of his Excellency the Governor-General, an outline of the proceedings of the

North-Australian Expedition, from the period of leaving the Victoria, on the 21st of June, to the 16th of December, 1856, when the Expedition reached Brisbane.

2. The exploration of the interior, beyond the sources of the Victoria River, having been carried to the full extent that the resources of the Expedition would admit, I made preparations for carrying out that part of the instructions relating to the exploration of the country between the Victoria and Albert Rivers.

3. In making these arrangements, it was desirable to provide against any contingencies which might prevent the land party obtaining supplies from the 'Tom Tough' at the Albert River, which I had appointed as a rendezvous for the Expedition; and it thus became necessary to reduce the land party to such a number that the horses now remaining could convey a sufficient supply of provisions for the whole journey to the out-stations in New South Wales, should we be compelled to do so, without further assistance.

4. I therefore organized a party of seven persons, consisting of myself, Mr. H. Gregory, Mr. Elsey, Dr. Mueller, C. Dean, R. Bowman, and J. Melville.

5. For the transport of this party and its equipment only thirty-four horses remained out of the fifty originally embarked at Moreton Bay. Of these, seven were appropriated as saddle-horses, and the remaining twenty-seven for the conveyance of the stores, etc., which comprised 1060 lbs. flour, 872 lbs. pork, 350 lbs. sugar, 380 lbs. meat biscuit, 100 lbs. rice, 30 lbs. sago, 32 lbs. tea, 30 lbs. coffee, 2000 rounds of ammunition, instruments, clothing, spare harness, etc., the whole weighing about two tons, exclusive of packages.

6. Having instructed Mr. Baines to embark the remainder of the exploring party and stores in the 'Tom Tough,' and proceed to Coepang for supplies of fresh provisions, and thence to the Albert River, to co-operate with the land party, I left the camp on the Victoria River on the 21st of June, 1856.

7. Proceeding up the Victoria to the eastern bend, in lat. 15° 38′, left the river on the 26th of June, and followed up a large creek, coming from the eastward. The country at first was very rocky, and indifferent quality, except on the immediate banks of the creek, till we approached its source, when the sandstones were replaced by basaltic rocks, and the country changed to fine open grassy ridges, very thinly wooded.

8. Beyond this creek (lat. 15° 33′, long. 131° 40′) a low sandstone table-land commenced, elevated about 700 feet above the sea. The country now changed to thinly-grassed Stringy-bark forest, destitute of watercourses, except a small creek which we struck in lat. 15° 30′, long. 132°. As no water appeared to exist except in this creek, I followed it down to the north-east to lat. 14° 54′, long. 132° 30′, where it turned to the north-west; but after five days' reconnoitring, succeeded in finding a passage to the east, across the table-land (which appeared to be the northern extension of the Interior Desert), to a small creek, tributary to the "Roper River," and moved the party to it on the 12th of July.

9. Attempting a south-east course, we were repulsed by scarcity of water, and had to trace down the creek to its junction with the Roper, in lat. 14° 58′, long. 133° 20′. The country improved, and was well suited for pastoral purposes, the rocks being basaltic.

10. Having followed the Roper twenty miles to the north-west, I again returned to a south-east course, re-entering a poor sandstone country, and on the 19th of July encamped on a small creek with a few waterholes.

11. In the afternoon a small party of blacks were observed watching the camp, and, on finding they were discovered by us, came up, but would not speak a single word, and soon after retired, but were detected stealing into the camp at night, when a discharge of small shot compelled them to retire.

12. The following day continued a south-east route, encamping at a spring in a sandstone ravine, where the grass was very inferior, and we experienced some difficulty in keeping the horses near the camp, their instinct doubtless leading them to avoid a spot where poisonous plants existed, as the next day at noon two horses were taken ill, and died in less than an hour after, the stomachs, on examination, showing the action of violent poison.

13. We continued to traverse a very indifferent country, with flat-topped sandstone ridges between scrubby valleys, in which small creeks took their rise, and, trending to the north-east, form the heads of the "Wickham" and "Liminin Bight" Rivers.

14. Scarcity of water however compelled us to turn to the northward, and travel along the broken sandstone country at the edge of the table-land, reaching the "MacArthur" River on the 4th of August,

in lat. 16° 25, where the channel did not exceed twenty yards in width, and so little water remained, even at this season, that it had to be followed down for some miles before a sufficient supply could be obtained.

15. Being desirous of keeping as far inland as possible, I again struck south-east, crossing the spurs of the table-land. In the valleys between, many small creeks took their rise, and form the heads of the rivers which flow into the Gulf of Carpentaria.

16. The principal feature of the country was sandstone, though basalt and limestone frequently cropped out, and formed small tracts of grassy country, which seemed to expand to the north of our route, but to the south the sandy table-land was almost unbroken.

17. The elevation of this table-land gradually increased to about 900 feet above the sea, and in lat. 17° 40′, long. 137° 40′, a spur, or rather a detached mass of greater altitude (1300 feet) projected from it to the north. From its higher ridges the view extended for forty or fifty miles to the south; all was hopelessly level, and without a single marked feature.

18. *August* 20.—Deep gullies took their rise on the south-east slope of this high land, rapidly increasing, by their junction, into a considerable creek, which proved to be the head of the Nicholson River. Considerable difficulty was however experienced in descending into its valley, owing to the abruptness of the ridges, which were formed by the edges of sandstone strata at a high angle, while granite prevailed in the lower ground.

19. The Nicholson however soon re-entered the sandstone ranges to the east, over which we toiled for three days, without finding sufficient grass for our horses. Following down the river, the country became more level; narrow grassy flats appeared on the banks, but the back country was still worthless, covered with very open scrub of *Terminalia* and *Melaleuca*, to within thirty miles of the Albert River, when grassy plains commenced, and extended several miles back from the right bank of the river.

20. On the 30th of August, crossed a fine running creek which joined the Nicholson from the south, in lat. 17° 53′, after which the river turned to the north. Continuing our route east-north-east for three miles, struck a fine brook of running water, with open grassy plains on its banks; its course was nearly east for four miles, when it was joined by a small creek from the south, forming a fine reach of water, which

we recognized as the Albert River of Captain Stokes, and Beams' Brook of Dr. Leichhardt.

21. As the junction of these two branches of the Albert had been appointed as the rendezvous of the two sections of the Expedition, it was with some anxiety that we approached the spot, though our journey from the Victoria had been so rapid that I could scarcely hope to find Mr. Baines had arrived before us. Our hopes were raised almost to certainty, when in the distance a tree, with an inscription recently cut in the bark, was seen in the exact place appointed, but a closer inspection showed that it was not the work of any individual belonging to the Expedition.

22. The following was the inscription which, cut in large characters, extended round the tree:—

CHUMMLUT +
↑ ORE
| RCH TO
1856

23. The remains of a large fire, the names of some of the boat's crew, and the word "Torch," were cut and scratched on the small trees and stumps around, but nothing to guide us in the search for any papers which would throw light on the object of the visit.

24. Having marked a tree with the date, initials of the Expedition, and instructions for finding a tin canister containing memoranda, which was buried near the tree, I moved the party to the right bank of the river, half a mile lower down, with the intention of proceeding downwards to the entrance of the Albert, but finding the water salt, I marked a second tree, and buried a tin with a memorandum of the proceedings of the Expedition, prospective movements, and instructions for the guidance of Mr. Baines, should he arrive after our departure, as it was not prudent, under existing circumstances, to await the arrival of the vessel.

25. On the 3rd of September, left the Albert River, and traversed a level open country, thinly clothed with indifferent grass, the soil a brown clay loam. Two days' journey south-east brought us to a river a hundred yards wide, in detached pools (lat. 18° 12′, long. 139° 55′). This river was mistaken for the Albert by Dr. Leichhardt, and I therefore named it after that enterprising explorer.

26. Soon after we encamped, a small party of natives approached, and assumed a somewhat threatening tone, but shortly retired. On the following morning about twenty came up to us, well armed, and,

while we were crossing a deep ravine, made a rush forward to attack us, but, when in the act of throwing their spears, were checked by a discharge of small shot, and were quickly dispersed, with the loss of their leader.

27. From the Leichhardt our course was nearly east, the country consisting of low sandstone ridges, very thinly timbered, and nearly destitute of grass. A few inconsiderable watercourses trended to the north, in which direction extensive grassy plains appeared to exist. Water was very scarce.

28. The country improved again as the Flinders River was approached, and where we crossed it, in lat. 18° 8′, long. 140° 50′, the grassy plains extended nearly twenty miles back from the river on both banks.

29. Beyond this we again encountered a worthless country, perfectly level, covered with small trees and *Melaleuca* scrubs. The scarcity of water repulsed us several times in the attempt to pursue an easterly course, and forced the party north on the meridian of 141° 30′, to lat. 17° 15′, when we reached a broad sandy river-bed, which is probably the "Gilbert" of Leichhardt.

30. The approach of the rainy season, which would prevent our drying the flesh of our horses, should we require to replenish our stock of provisions, and the general health of the party rendering it desirable that fresh meat should for a time be substituted for the salt pork, which had suffered much from the heat of the climate, both in quantity and quality, on the 18th we killed one of the horses, which had become otherwise unserviceable. The meat was cut into thin slices, and dried in the sun. The process occupied two days; it was very tough, but by long stewing became very palatable, and scarcely distinguishable from beef.

31. The general course of the Gilbert was from the south-east, and this enabled us to resume our course, as a sufficient supply of water existed in its channel, though several miles often intervened between the pools. The country along this river was extremely level; only one ridge of hills was seen till we reached lat. 18° 20′, long. 143° (27th of September), though the bed of the river rose to about 700 feet above the sea-level. Grassy flats extended along its banks, from one to two miles wide; beyond which the country was very poor, with patches of *Melaleuca* scrub.

32. Low ranges of hills now rose abruptly from the plain,—the prevailing rocks, slate, porphyry, gneiss, and granite. A decided improvement was also observed in the vegetation.

33. On the 5th of October reached the head waters of the eastern branch of the Gilbert, and as it was necessary to reconnoitre the country before moving the party across the ranges, I proceeded onward with Mr. H. Gregory for that purpose, and had a horse killed and dried during my absence from the camp.

34. On the 11th the party moved across the ranges, which rose about 2500 feet above the sea-level, in lat. 18° 45′, long. 143° 50′, and encamped on a large sandy creek, tributary to the "Lynd" River, the southern branches of which we crossed the following day.

34*. The lower part of the valley of the Lynd was here about 1500 feet above the level of the sea, the primary ranges rising abruptly to the west, but the eastern side was formed by a gradually rising sheet of basaltic lava, which separated it from the valley of the "Burdekin." This portion of the country was well grassed, but, from the porous nature of the rock, destitute of surface-water.

35. On the 14th descended into the valley of the Burdekin, and on the 16th reached that river, in lat. 18° 57′, long. 144° 50′. The channel was about fifty yards wide, with a small running stream of water winding along the sandy bed. The country was of a very broken and almost mountainous character, the valley and some lower ridges well grassed and suited for stock, the higher ranges usually poor and stony.

36. Except in the river itself, surface-water was very scarce at this season, and our route consequently along its right bank; the general course south-east.

37. Below the junction of the "Clark" the country improved considerably, large tracts of basaltic rock forming very fertile land by its decomposition.

38. South of lat. 20°, granite and trap prevailed, forming fine open grassy ridges, timbered with Iron-bark; and this continued to lat. 20° 40′.

39. Reaching the junction of the Burdekin with the "Suttor" River on the 30th of October, in lat. 20° 36′, long. 146° 50′, I followed up the latter river, soon encountering dense Brigalow scrubs, which gradually extended over the whole face of the country, and impeded our progress considerably.

40. In about lat. 21° 30′, long. 146° 40′, the Suttor is joined by the "Belyando" of Sir T. Mitchell. This river was running, there having been heavy rains on the upper part of its course.

41. Availing myself of this favourable circumstance, I followed it up to lat. 22°, and then steered south-east, in hope of finding a more open country, but after crossing a low ridge of sandstone hills, entered a vast level plain, covered with Brigalow scrub, which continued to lat. 22° 40′, long. 147° 10′, where we crossed a range of scrubby mountains, and descended to "Peak Downs" on the 12th of November.

42. Peak Downs, as seen from the western range, extend north-west and south-east for about sixty miles, with a breadth exceeding thirty miles, consisting of gently undulating plains of rich black soil, well grassed. These plains are separated by belts of thick scrub, the prevailing rock, basalt and limestone. The absence of the surface-water will however prove a serious drawback to this otherwise fine tract of country.

43. This scarcity of water obliged the party to skirt the south-west limit of the open country, and much Brigalow scrub was encountered.

44. On the 15th of November, reached the left bank of the "Mackenzie" River, about fifteen miles above its junction with "Comet" River.

45. Being nearly on the latitude of Port Curtis, I steered an easterly course through a succession of dense scrubs, and on the 22nd of November reached Messrs. Fitz and Conner's station on the Dawson River, where we experienced a most hospitable reception.

46. It now only remained for me to connect the route of the Expedition with some known point on the surveys of the district, and I proceeded to Mr. Hay's station, near which the Crown Lands' Commissioner of the district was encamped; but as the duties of this department have little reference to the geographical features of the country, the position of the stations could not be ascertained. Mr. Wiseman however afforded me all the information in his power, and I consequently proceeded fifty miles by the road towards Gladstone, to obtain bearings to Mount Larcom and other hills near Port Curtis.

47. The party then travelled by the road through the Burnett District, and reached Brisbane on the 16th of December, 1856.

48. Extreme monotony characterizes the physical features of the whole country traversed by the Expedition from the Victoria to the

140th meridian, the interior country appearing to consist of a table-land of sandstone formation, averaging 800 feet above the sea-level, along the edge of which small rivers take their rise, and traverse the short space which intervenes between the table-land and the ocean.

49. This table-land appears to form the continuation of the interior desert which exists to the south of the Victoria, the geological structure being the same, though from its greater proximity to the coast, on the line traversed, causing a less arid climate, the soil supports a greater amount of vegetation, and consequently it did not exhibit those remarkable ridges of drifting sand which characterize the more inland portions.

50. It was this inhospitable region, destitute of the requisites for the support of the party, which compelled the Expedition to deviate so much towards the coast, and by following the northern slope, take advantage of the watercourses which there take their rise, and originate the numerous small rivers crossed by Dr. Leichhardt in his journey along the coast of the Gulf of Carpentaria.

51. I was desirous, had the nature of the country justified the attempt, of taking a more inland course than that traversed, but the absence of tributaries on the eastern side of the upper valley of the Victoria, had warned me that the country in that direction was impracticable at the period of the year, as the wet season had terminated before the return from the exploration of the interior.

52. The route of the Expedition was perhaps that which will tend more to develope the physical character of the northern portion of the continent, as the distance to which the rivers extend from the coast has now been approximately ascertained, as none of the watercourses could extend any considerable distance into the interior beyond the line traversed by the party.

53. The insignificant size of the watercourses crossed between the Victoria and Albert Rivers, is almost a proof that no country available for the purposes of settlement exists to the south of the line traversed, while the small quantity of available land seen to the north, and the unfavourable account given by Leichhardt of the parallel line on which he travelled near the coast, renders it improbable that any considerable tract of land suitable for settlement exists on the south-west shore of the Gulf of Carpentaria.

54. On the western shores of the Gulf, the extensive development

of basaltic rocks results in the formation of a fine tract of pastoral country, in which the Roper River takes its rise.

55. The "Plains of Promise," which occupy the south shore of the Gulf between the meridians of 139° and 141°, extend little beyond lat. 18° 10′, south of which we always met with miserable sandstone ridges, except on the banks of the Flinders and Leichhardt Rivers, and the whole of those plains seem to result from the gradual recession of the waters of the Gulf. The grass was generally inferior, both in quantity and quality, to that on the Victoria or the eastern coast. Water is scarce during the dry season, and the surface is so level that it is excessively wet and boggy during the rains.

56. Had the vessel reached the Albert in time to co-operate with the land party, my intention was, to have explored the courses of the Leichhardt and Flinders Rivers, which are now the only rivers in Northern Australia, the sources of which have not been ascertained, though from their small size there is reason to think that they do not extend more than 100, or at the most 150, miles from their mouths.

57. East of the Gulf, after receding thirty miles from its shores, the level country is covered with worthless scrubs of *Melaleuca*, and *Triodia* covers the more open country. Even along the course of the Gilbert, the extent of available country is by no means great.

58. Crossing from the western to the eastern waters, a marked change was observed, after travelling over nearly 13° of longitude, in a country where the same geological and physical characters were almost constant. The sandstones were completely superseded by slates and primary rocks, climate and vegetation seemed to change in the space of a few miles, and it was only where wide-spread plains of basaltic lava, with their peculiar vegetation, occurred, that any semblance of the western country remained.

59. Although large tracts of inferior country exist on the upper portion of the Burdekin, yet there are many fine patches of country well adapted for stock, while the never-failing supply of water in its channel, the hilly and varying character of the district, by protecting it from the serious consequences which attend long droughts in more level portions of Australia, will render it eventually one of the important districts of the Colony.

60. South of the Burdekin we encountered the first Brigalow scrub, which formed a broad belt, widening as it receded from the coast, and

it separates the fine country just referred to from the valleys of the Mackenzie, and other tributaries of the Fitz Roy River.

61. So large an extent of this latter district has already been tendered for as stock-runs, and reported upon by the Commissioner of Crown Lands, that it would be useless for me to attempt a further description, which would necessarily be imperfect.

62. With reference to the capabilities for settlement, the portion of Australia traversed by the Expedition may be divided into three sections, each with its distinct character, climate, and geographical position, viz. the north-west coast, the Gulf of Carpentaria, and the eastern coast.

63. The first of these offers considerable facilities, the Victoria giving access to the interior; the navigation is by no means difficult, if due precaution be observed. That the country is suited for stock, is shown by the excellent condition of our horses and sheep, which recovered rapidly from a state of extreme exhaustion, consequent on the protracted sea-voyage, while there is reason to believe that large tracts of good country extend as far to the south-west as the Fitz Roy, beyond which the desert appears to come down to the coast.

64. Considering its position within the tropic, it is well watered by the rivers; and though the climate is extremely hot during three months of the year, the dryness of the atmosphere seems to counteract that unhealthiness which is usually inseparable from these latitudes.

65. The country around the Gulf does not offer any great inducement to the settler, being devoid of good harbours; the rivers are only accessible for small vessels, while the available country bears but small proportion to that which is utterly worthless. Its relative position causes its climate to participate in some degree with that of the Australian interior, and appears to be subject to drought.

66. On the eastern coast a large proportion of good country exists along the course of the Burdekin River and its tributaries. It forms a continuation of the tract which extends north from Moreton Bay, over which the stations are extending with such rapidity, that a few years will probably suffice for the settlement of the country to lat. 18°.

67. Judging from the character of the vegetation, the climate of this part of Australia is cooler and more humid than that of the Gulf or north-west coast; the rainy season is not confined to any particular period of the year, being situated between the intertropical and extra-

tropical climates, the wet season of the former occurring from November to March, and the latter from May to September.

68. With reference to the aborigines of Northern Australia, I have been able to collect little information. Except in the immediate vicinity of the sea-coast at the mouth of the Victoria, and on the southern shores of the Gulf of Carpentaria, their numbers are apparently small, though the recent traces in every part of the country visited showed them to be diffused over the whole, and small parties were often seen.

69. Except on the few occasions detailed in the journal, our interviews were of a friendly nature, though twenty-six years' constant intercourse with the aboriginal Australians has convinced me how little their professions are to be relied on, and I therefore never relaxed those precautionary measures which, though they somewhat interfered with the collection of information regarding their habits and customs, has, with one exception, enabled us to avoid collision with them.

70. In no part did I observe any marked difference in race or form of weapons from the aborigines of the western coast, except such variations in the latter as were requisite from the difference of the materials from which they were constructed. The language differed from either that of Moreton Bay or Western Australia. Circumcision, and the removal of the front teeth, is practised by some of the tribes, but others which intervened did not practise either rite.

71. Circumstances, over which I had no control, compelled me to impose many duties on the scientific officers of the Expedition, which of course greatly circumscribed their opportunities for collecting specimens and notes relative to the departments specially in charge. A large collection had however been made before I left the Victoria, to which the unabated zeal of Mr. Elsey and Dr. Mueller has enabled them to make many valuable additions during the last journey. And it gives me pleasure to record my thanks to those gentlemen, and also to Mr. H. Gregory (to whose unwearied care and judgment in conducting the transport service of the Expedition, the extraordinary rapidity and success of the several journeys is mainly attributable), for the cheerful assistance and support they ever afforded me in carrying out the objects of the Expedition. To Mr. Baines I am also particularly indebted, and can only regret that I have been compelled to detach him on a service which, while it almost precludes his devoting his time to his artistic pursuits, imposes duties of a peculiarly harassing nature.

72. I would also bring under his Excellency's favourable notice the excellent conduct of Charles Dean, Robert Bowman, and John Melville, who accompanied me from the Victoria to Moreton Bay, and whose constant attention to their several duties, and their cheerfulness under privations of no ordinary nature, merit the highest commendation.

73. I am now preparing a map of the route of the Expedition from the Victoria River towards Moreton Bay, and will transmit the same on its completion.

74. All the documents relative to the Expedition, previous to the 21st of June last, are now on board the 'Messenger,' which vessel was employed on the service of the Expedition after the 'Tom Tough' became unfit for further service; and I daily expect her arrival in Sydney, with the remainder of the party in charge of Mr. Baines.

I have the honour to be, Sir, your obedient Servant,

A. C. GREGORY,

Commanding N. A. Expedition.

On three new Indian SCROPHULARINEÆ; *by* J. D. HOOKER, M.D., F.R.S., *and* T. THOMSON, M.D., F.R.S. (TAB. VII. and VIII.)

During the arrangement of the Indian *Scrophularineæ* with those in the Hookerian Herbarium, in which operation I enjoyed the advantage of Mr. Bentham's supervision, that gentleman pointed out several of the species as being well worthy of illustration, and amongst them the three now to be described are, on all accounts, perhaps the most remarkable.

In the whole collection, which includes almost every previously described or noticed Indian plant of the Order, there are about 250 species, including *Orobanche* and its allies; and, except in the genus *Pedicularis*, there is indeed very little novelty. A fine subalpine *Boschniakia* (*B. Himalaica*, H.f. et T.), previously found by Messrs. Strachey and Winterbottom, is a curious additional instance to the several known of the extension of an American genus into Central Asia; and there are some interesting plants amongst the *Veronicæ* and *Scrophulariæ*, but the majority of Indian *Scrophulariaceæ* are annual weeds of very common forms and widely extended distribution.

J. D. H.

1. Nov. Gen. Lancea, *Hook. fil. et Thoms.*

Calyx æqualis, late campanulatus, 5-fidus. *Corollæ labium* superius suberectum, oblongum, bifidum, inferius multo majus, patens, trifidum, ad faucem longitudinaliter bigibbosum. *Stamina* fertilia 4, antherarum loculis contiguis didymis; polline trilobo. *Ovarium* late oblongum; stylo gracili; stigmate bilamellato; laciniis late cuneatis retusis. *Bacca* globosa, carnosa, bilocularis; placentis crassis, polyspermis. *Semina* subglobosa, compressa; testa obscure reticulata; embryone brevi; cotyledonibus crassis, radicula brevi latioribus.—Herba Tibetica habitu et affinitate *Mazo* proxima, sed abunde differt bacca carnosa indehiscente.—Radix *annua.* Caulis *brevis v. subnullus, rarius elongatus, interdum stolonifer.* Folia *plerumque omnia radicalia conferta et stellatim patentia, interdum secus caulem elongatum per paria distantia, opposita, petiolata, obovata v. obovato-lanceolata, aucta v. obtusa, integerrima v. obscure serrata, glaberrima.* Flores *in racemos breves (rarius elongatos) dispositi, breve pedicellati;* pedicellis *basi bracteolatis.* Calyx *glaberrimus.* Corolla $\frac{1}{4}$–1-*pollicaris, læte ceruleo-purpurea, extus glaberrima v. puberula, intus ad faucem pilosa.* Bacca *rubra, matura fusca v. nigra, diametro pisi, parietibus fasciculis 2 lignosis placentis oppositis instructis.* Semina *perplurima, fusca.*

1. Lancea *Tibetica*, H.f. et T. (Tab. VII., figura inferior.)

Hab. In regione alpina et subalpina Tibetiæ orientalis et occidentalis necnon Himalayæ provinciæ Sikkim; alt. 10–15,000 ped.—(Fl. August.)

The singular little plant above described is extremely common in many parts of Tibet, growing in sandy and moist places, generally closely appressed to the ground, and is sufficiently conspicuous from its blue-purple flowers. Like all alpine plants, it varies extremely in the size and luxuriance of its stems, flowers, and leaves, some of our specimens being twice as large as those figured, and others again very minute. The relative length of the tube and limb of the corolla is also very variable, and of the calyx too. We have named it in honour of Mr. Lance, of the Bengal Service, to whom we are indebted for some interesting Tibetan and Kashmir plants, contributed through our friend M. P. Edgeworth, Esq.

Plate VII. (lower figure). Fig. 1. Flower. 2. Corolla, laid open,

W Fitch del. et lith.

Vincent Brooks Imp.

Lancea Tibetica, Hf.&T.

and ovary. 3. Anther. 4. Apex of style. 5. Ovary. 6. Ripe fruit. 7. Transverse section of ditto. 8. Seed. 9. Vertical section of ditto, showing the embryo:—*all* but fig. 6 *magnified.*

2. Micranthemum, *Rich.*

1. Micranthemum *Indicum,* Hook. fil. et Thoms.; caulibus simpliciusculis, foliis subulatis, calycibus lanceolato-subulatis corollam minimam longe superantibus, filamentis basi inappendiculatis. (Tab. VII., figura superior).

Hab. Montibus Khasiæ, submersa paludosis ad Nonkreem; alt. 4–5000 ped.—(Fl. Octob.)

Herba pusilla, flaccida, laxe cæspitosa, erecta, annua, glaberrima, dum florens omnino submersa. *Caules* 2–3-pollicares, teretes. *Folia* $\frac{1}{3}$–$\frac{2}{3}$ unc. longa, basi 3-nervia. *Flores* axillares, erecti. *Sepala* valde elongata, foliacea, $\frac{1}{4}$ unc. longa. *Corolla* minima, subcylindrica, membranacea, breviter 4-loba, lobis rotundatis, arcte imbricatis, genitalia tegentibus. *Stamina* subsessilia; *filamentis* brevibus, interdum gibbosis; *antheris* 2-locularibus, loculis fere parallelis, apicibus deorsum subacutis, nunc vacuis v. deformatis. *Ovarium* compressum, oblongum; *stylo* crasso, curvo; *stigmate* subcapitato, celluloso. *Capsula* late oblonga, compressa, utrinque obtusa, valvis bifidis v. bipartitis. *Semina* plurima, erecta, lineari-oblonga; *testa* grosse reticulata; *embryone* majusculo.

A very singular and inconspicuous plant, which we have placed in *Micranthemum,* with Mr. Bentham's sanction. As with many of these minute water-plants, the floral envelopes vary very much, and the corolla is, in this species, so extremely minute and membranous, that we have had to destroy many before obtaining an approximately accurate view of its parts. In all cases we find it closely imbricating over the stamens and pistils, and effectually protecting these from the action of the water, and it is very difficult to open the buds without much mutilation of the lobes; these however appear to be usually four, alternately smaller and larger. The stamens are certainly extremely variable and often deformed, the filaments excessively short, and in some specimens gibbous at the base, as in the American *Micranthemum,* but in others not so. Mr. Fitch has figured the anthers as hairy, a character we did not observe in any case, and suspect some mistake.

Plate VII. (upper figure). Fig. 1. Leaves and flowers. 2. Corolla.

3. The same, laid open. 4. Anther. 5. Transverse section of ovary. 6. Ripe capsule in calyx. 7. The same, removed, and another, longitudinally cut. 8. Seed. 9. Longitudinal section of ditto:—*all highly magnified.*

3. Melampyrum, *L.*

1. Melampyrum *Indicum*, H.f. et T.; caule gracili erecto virgulato ramoso, ramis elongatis tenuibus puberulis, foliis petiolatis lanceolatis ovato-lanceolatisve acuminatis glaberrimis, floralibus subsimilibus scaberulis, racemis laxis, floribus pedicellatis puberulis, calycis dentibus tubo subæquilongis corollæ tubo angusto multoties brevioribus, capsula ovato-lanceolata acuminata. (Tab. VIII.)

Hab. In apricis montibus Khasiæ, alt. 5–6000 ped.—(Fl. September.)

The occurrence of a genuine species of *Melampyrum* in Eastern Bengal, and at a moderate elevation above the sea, would of itself be a sufficiently remarkable fact, but is rendered in the present case all the more so, from the genus not appearing elsewhere in any part of India; it has neither been detected in Afghanistan or Tibet, where European genera prevail, nor hitherto in China, where all the other temperate Khasian forms, which are not European or Himalayan, are found. Several species inhabit the Caucasus, which is the eastern limit of the genus in Central Asia; and one, *M. cristatum*, inhabits the Altai Mountains; another, a variety of *M. pratense*, occurs in North America. The *M. Indicum* is a remarkably distinct species; it forms a slender, twiggy, branched herb, two feet high, with small leaves and scattered flowers, half an inch long, of a blood-red colour, which turn of a leaden blue when dry. The structure of the calyx, corolla, stamens, ovary, curious ovules, and seeds, is precisely in all points as in the European species. It is a very local plant in the Khasia, but most abundant where found.

Plate VIII. Fig. 1. Flower. 2. Corolla, laid open. 3. Ripe capsules. 4. The same, laid open, showing the seeds:—*all magnified.*

Observations on the Cissus quadrangularis *of* Linnæus; *by* N. A. Dalzell, M.A.

Throughout the province of Guzerat there grows a singular-looking *Cissus*, which I have not seen in any other part of India, and which,

W. Fitch del. et lith. Vincent Brooks Imp.

Melampyrum Indicum, H.f. & T

on a cursory examination, I took to be a variety of *C. quadrangularis*, Roxb. Fl. Ind., the *Vitis quadrangularis*, Wall. (in Wight and Arnott's Prodromus). If however the descriptions in these works are perfectly correct, it can scarcely be that species. The Guzerat plant is invariably wingless, the fruit ovoid and pointed (not globose), twice as large as a pea; and although it leaves a slight biting sensation on the tongue, still it is not "very acrid," as described by the authors alluded to, and, as we are informed by Duchesne, in his 'Plantes Utiles,' is eaten in Senegambia under the name of "Raisin de Galani," which would not be the case if the fruit were "very acrid." Further, Roxburgh describes the roots as fibrous, Willdenow and De Candolle as tuberous, a discrepancy which, with those already mentioned, leads to a suspicion at least that two distinct species of *Cissus* are confounded under the name of *Cissus quadrangularis*, even after making due allowance for a considerable amount of variation induced by differences of climate. In the older descriptions of this plant by Linnæus, Förskael, Persoon, etc., there is no mention of wings to the stem, while in Roxburgh's 'Flora Indica' and Wight and Arnott's 'Prodromus' the wings are a prominent part of the diagnosis, while the tubers on the roots are not mentioned at all, that is, virtually denied. There is no reason to think that any of these distinguished authors have described the plants before them incorrectly, and therefore we are forced to adopt one of two conclusions, either that two distinct species are included under one name, or that the influence of climate in this particular instance deprives a plant of what have been regarded by excellent botanists as essential specific characters. I am inclined to the former of these, and if my surmise is correct, the two species may be distinguished as follows.

Cissus *quadrangularis*,* Linn. Mant. 39 (non Roxb.); glaberrimus, scandens, radice tuberosa, caule herbaceo dichotomo obtuse quadrangulari tumidiusculo articulato, articulis constrictis, stipulis adnatis rotundatis bi-auriculatis caducis, foliis petiolatis crassis carnosis cordato-rotundatis integris vel sæpius trilobatis margine serrato-denticulatis, umbellis in pedunculo dichotome ramoso abbreviato paucifloris, fructu ovoideo lævi rubro 1-spermo, semine subconformi.—*Willd. Sp. Pl.* i. p. 657. Sælanthus quadrangularis, *Försk. descr.* 33. *Ic. t.* 2.

* *Cissus tetrapterus*, Nob. in Fl. Nig. p. 263, manifeste est eadem planta, etsi angulis ramulorum exemplaribus desiccatis anguste alatis.—J. D. H.

Hab. Guzerat, Arabia, Senegambia, Egypt.—Guzerat name, "Hursankur."

From an old 'Hortus Jamaicensis,' it appears that this species was introduced into the West Indies about fifty years ago, and there found to be tuberous-rooted and wingless. In Graham's 'Catalogue of Bombay Plants,' it is stated that the winged species (which I have never seen) is there cultivated in gardens, and eaten in curries by the natives. The natives of Guzerat however have no idea of such a use of the wingless plant, nor is the winged one known to them. The whole plant is of a pale glaucous-green; the root is composed of four or five thick fibres; the tubers appear as if they were swellings in the middle of these fibres; the leaves are 2–3 lines in thickness; the seeds are oblong, rather pointed at the base, 4–5 lines in length; the testa dark-brown, and covered on the inside with a layer of minute silver-coloured scales, not unlike those on a moth's wing; the endopleura is light-brown, smooth, and polished; but the embryo is perhaps the most remarkable feature, and is hexacotyledonous!, the axis is thickened upwards from the radicle, and is furnished with three wings, as it were, each wing being composed of one pair of cotyledonary leaves!

Cissus *edulis*, Dalzell; radice fibrosa, caule quadrangulari læte tetrapteris, stipulis lunatis integris, foliis breve petiolatis cordato-ovatis integris serrulatis, umbellis breve pedunculatis, fructu globoso acri 1-spermo pisi minoris magnitudine, semine obovato.

Vitis quadrangularis, *Wall. in Wight et Arn. Prod.* i. *p.* 125.—*Wight, Ic. t.* 51, *excl. fig.* 6. Cissus quadrangularis, *Roxb. Fl. Ind.* i. *p.* 407.

Hab. Crescit ubique in India orientali, *Roxburgh.*

Dr. Baikie's *Second Exploring Voyage up the* Kwora (Niger).

We have the pleasure to lay before our readers the following extracts of letters from Dr. Baikie, the commander, and Mr. Barter, the botanist, on board the steamer recently despatched for the further exploration of the Kwora. Our first letter is from Mr. Barter, and bears date—

Ship 'Camden,' off Monrovia, May 15, 1857.

Leaving Sierra Leone hurriedly yesterday (*en route* to Fernando Po), I could do no more than send a list of the fruits in cask, and living

plants in cases; but as we spend a short time here, I forward a few lines.

Orchids I found in abundance at Sierra Leone; the trees on the mountains are laden with them, and many occur even on the low grounds. I have enclosed about thirty kinds, perhaps more, in the cask. At this season they are not in flower.

Ferns are also plentiful, but I could not send many, my time for collecting the live specimens being very limited. I have however dried a large number, and am carrying them on to Fernando Po, as they were too damp for despatch from Sierra Leone. *Acrosticha* prevail most; *Hymenophyllum* and *Trichomanes* grow on the mountains, some kinds being new to me; and I send a curious *Arthopteris* in the case.

Of the genus *Amomum* I forward three species (living roots); they are *A. Danielli*, *A. Granum*, and another, from the Sugar-loaf Mountain.

I am aware that some of the Orchids which I transmit are already in cultivation, as *Eulophia Guineensis*, and some of the *Angræca* and *Bolbophylla*. Among the fruits, the one which I consider most interesting is the "Krooman's Papaw;" it is as yet but little known in Sierra Leone, but is said to be plentiful in Monrovia. I am ignorant of the tree which produces it.

The heavy swell which prevails on this part of the African coast renders writing very difficult; but when we reach Fernando Po, which will be in about ten days, I hope to give you some account of the vegetation hereabouts and at Sierra Leone.

C. Barter.

The second Letter is from Dr. Baikie, dated—

Off Cape Coast Castle, West Africa, May 18, 1857.

I have only time for a few hurried lines. My assistants have been most indefatigable, and by this mail I send you part of our collection of specimens of plants, as far as they are dry. It comprehends half an hour's work at Madeira, two hours' work at Teneriffe, a forenoon's work at the Gambia, and part of our collections at Sierra Leone, all the neighbourhood of which has been explored. Being at the end of the dry season, the time was not favourable, still I hope you will find some novelties. There is a cask of Orchids, a case of dried plants and seeds, a cask of fruits, etc., in spirits, and a rude Wardian case I had constructed, with some living plants. Please ask Mr. Smith to let

Mr. Hanbury know that there are among them some Scitamineous specimens for him, but that we have found, what I always suspected, that Dr. Daniel's localities did not afford us the plants he attributed to them. I will send you from Fernando Po a detailed list of the specimens, and I hope also to send then about five hundred more dried Sierra Leone plants.

If we have any spare time at Fernando Po, you may depend upon it, it will not be wasted.

W. Balfour Baikie.

The third Letter, also from Dr. Baikie, is dated—

Fernando Po, May 30, 1857.

Having a little more time than I had when I wrote so hurriedly to you about three weeks ago, I shall give you a little more in detail an account of our botanical proceedings. I enclose, with this, lists of the fruits in the cask, and of the plants in the Wardian case, with their localities. The dried plants sent are all labelled, and the Orchids in the small cask are also marked. I think the number of Orchids is greater than what you would expect, but they seem very abundant about Sierra Leone. I think some of the fruits in the cask will also be new to your collection. I am very much pleased with Mr. Barter, who works very hard, is very enthusiastic, and gets on well. After leaving Sierra Leone the weather did not permit of our landing along the coast, though I should have much liked to have botanized for a few hours at Cape Coast Castle. Since our arrival here we have examined the neighbourhood of Clarence, and made one or two excursions towards the base of the mountain, but the season is very unfavourable, as heavy rains are of daily occurrence, and the deep clayey soil of the island, becoming soaked with the wet, renders progression almost impossible, and most laborious, especially along the miserable footpaths of the island, barely wide enough for a single person. As we shall be here for eight or ten days yet, I shall not send anything by this mail, but shall leave it for the next, when I shall forward all I have got. We have a number of Sierra Leone plants, about five hundred species, with duplicates of almost all, and I expect that many of our Fernandian plants will be dry enough for the voyage home; the rest must be taken up the Niger for the present. We shall also have some curious fruits, which will be sent home moist, and a few seeds and dry fruits. Yesterday I got an intelligent black man as a guide, who took my two

assistants by a very difficult path, beyond the region of Palms, towards that of large forest-trees, some having fine upright stems upwards of a hundred feet in height. Several fine examples of the red wood of the island were seen, but without any possibility of getting leaves or flowers, which can only be obtained when a tree is cut down. The trunks of the larger ones are all furnished with laminar buttresses, like those of *Bombax*. *Oldfieldia Africana* is said to be common, but we have not yet fallen in with it. We have got many very fine Ferns, and a few Orchids, one very singular one, probably new, and yesterday we found a *Kigelia*, with fruit and flower, the former differing from what I found up the Niger. Altogether I think you will find several novelties from this island, and if we ever happen to be here just after the rainy season, we shall make a fine collection. My assistants now are in excellent condition and training for the Niger, and by attending closely to my directions, have kept their health perfectly, though under the old system they would have been laid up long before this. The cases, etc., will be consigned as before to Messrs. W. Laird and Co., Liverpool, to whom instructions about them may be previously sent; there will be two at least, if not three.

I enclose also lists of the fruits we observed at Sierra Leone, and those of this island; attached to the dried plants are any notes of information we have been able to collect about their uses by the natives. From Sierra Leone we brought away seeds of the following, not now known up the Niger, which I wish to introduce there, viz. Orange, Avocado Pear, Mango, Guava, Granadilla, Sweet-sop, Rose-apple, and a number of Pine-apple tops. Round Sierra Leone the Mango is most abundant, forming magnificent trees, though about fifteen years ago there was hardly one in the colony. I am sorry I did not get seeds of the Mangosteen, to try to introduce into Africa.

W. Balfour Baikie.

The following is the list of African fruits alluded to in the above extracts:—

I. *Fruits observed at Sierra Leone.*—1. Plantain, three varieties. 2. Banana, four ditto, viz. *a*, Mary, the smallest; *b*, Jamaica, triangular fruit; *c*, red, firmer consistence, fine flavour, deep peach-red; *d*, common. 3. Bread-fruit. 4. Monkey Apple. 5. Mango, four varieties, *a*, common; *b*, cherry, small; *c*, peach, large, fine peach-tint, and best flavour, identical, I believe, with what is called No. 14 in the West

Indies; *d*, hog, large, but good flavour. 6. Granadilla, two varieties, one laurel-leaved. 7. Papaw, two varieties. 8. Sour-sop. 9. Sweet-sop. 10. *Spondias*, several species, "Hog Plums." 11. Custard Apple, rare. 12. "Damson Plum." 13. Guava, two varieties. 14. Avocado Pears. 15. Beacon-bush, called "Kêbbit" by the Wólofs. 16. Rose Apple. 17. Cashew-nut. 18. *Inga biglobosa*. 19. *Dialium Guineense*. 20. "Kruman's Papaw," called Tába by the Wólofs, and Tabanána by the Mandéngas. 21. *Chrysobalanus Icaco*. 22. Orange, two varieties, one smaller, bright-yellow, and thin rind, the other large, green when quite ripe, with thick rind, but well-flavoured. 23. Lime. 24. Shaddock. 25. Cocoa-nut. 26. Pine-apple, two or three varieties, the finest called the "Black Pine."

II. *Fruits observed in Fernando Po*.—1. Cocoa-nut. 2. Plantain. 3. Banana. 4. Guava. 5. Mango. 6. Pine-apple. 7. Papaw. 8. Orange. 9. Lime. 10. Avocado Pear. 11. Bread-fruit. 12. Sweet-sop. 13. Sour-sop. 14. Pomegranate. 1–9 are abundant.

[The arrival of the cases of plants is daily expected per the steamer 'Niger.'—Ed.]

BOTANICAL INFORMATION.

Destruction of the Gutta Percha *Trees in Singapore.*

A valued friend and correspondent, a mercantile gentleman in Singapore (Charles Wilsone, Esq.), has given us the following interesting particulars relative to the destruction of the trees of Gutta Percha (*Isonandra Gutta*) in that island.

"Your letter of the 3rd of October reached me by last mail, and I assure you it will give me much pleasure if I can be of use to you in any way out here, either in collecting any information you may require about our vegetable substances in Singapore and the neighbouring countries, or in procuring specimens of them for your museum at Kew.

"I have commenced to collect all the different Guttas that are brought to Singapore in the Malay and Bugis prahus, and when I have succeeded in procuring specimens of the principal part of them, I will send them to you.

"Many of those passing under different names however are merely different qualities of the same stuff, or prepared in a different manner. Seeds of the Gutta Percha tree, and flowering specimens of the plant, I am afraid I shall not be able to procure in Singapore, as we have nothing but very small trees left in the island now; all those old enough to yield even a very small quantity of sap having been cut down by the Malays; but Sir James Brooke, who has been staying here, has promised to send me both from Sarawak, where there is no difficulty in procuring them, there being abundance of full-grown trees still.* The trees are always cut down here to procure the sap, though I have no doubt it is very bad policy to do so, since by tapping them a good quantity of sap easily runs, and it might be repeated again after giving the trees a reasonable time to recover. Natives will never consider any future advantage, their great object being to get the largest quantity at a time. Their argument, too, that unless the trees were private property, and could be looked after, it would be impossible to protect them from one's neighbours, is very true; and this would be quite out of the question in the extensive forests where the Gutta trees are found. At some future period, I have no doubt the Gutta Percha tree will be quite extirpated in all the countries about Singapore. Being always cut before it has a chance of seeding, it cannot continue to exist unless the price rises to such an extent as to make it worth while planting the tree on private property.

"It is to be found" (the identical species?) "over nearly the whole Archipelago that is inhabited by the Malay race, but as far as I know does not extend further to the east. True Gutta Percha is called *Gutta Tabban;* most of the other Guttas are varieties of Caoutchouc. Neither the Malays nor the Chinese make much use of Gutta Percha as far as I have seen. Knife-handles and small buckets seem to be the principal uses they put it to; it is sometimes made into bands for tying things with also, but I have not often seen it used in this way.

"The quantity of Gutta Percha exported from Singapore in 1855 was

* The Borneo Gutta Percha, we believe, is much less esteemed than that of Singapore, and from specimens of the leaves that have been sent us by Sir James Brooke, it would appear that the species is different from the true Gutta Percha. The veritable *Isonandra Gutta* has however recently been detected in Sumatra, and a specimen has been sent to us by our excellent friend Professor De Vriese, of Leyden.—ED.

about 1900 tons, but this year it will be much short of that amount, probably not over 1500 tons. Its present price is 22 dollars per picul ($133\frac{1}{3}$ lbs.) for good quality.

"P.S. The principal other vegetable substances exported from here are, Gambier, Camphor, Sago, Pepper, Coffee, Sugar, Sapan-wood, Mangrove-bark, Nutmegs and Mace, Rattans, Canes, Cubebs, Gum Benjamin, Dragon's-blood, Gamboge, Vegetable Tallow, Vegetable Wax, Gum Copal, Cloves, Tapioca, Arrowroot, Rice, Cassia, Gum Elastic, Seaweed, Sandal-wood, Galingals, Rhubarb, Cutch, Ginger, Teel-seed, Ebony, Cocoa-nut Oil, Wood Oils, Betel-nut, Cardamoms, China-root, Timber, besides others which escape my memory at present."

Musschia Wollastoni.

To the Editor of Hooker's Journal of Botany.

3, Red Lion Square, June 26th, 1857.

Sir,—Will you allow me to correct an inaccuracy, for which I am myself responsible, with regard to the dimensions of *Musschia Wollastoni*, as given in the letter of Mr. James Y. Johnson, in the June number.

Conversing with that gentleman in Madeira on the subject of this truly magnificent plant, I stated, from recollection, the height of the largest raceme I had seen to have been $2\frac{1}{2}$ feet, and the breadth $1\frac{1}{2}$ feet, and wishing to avoid exaggeration, it appears I fell into the opposite extreme, for on measuring specimens in my possession, I find the height of one raceme to have been 3 feet 4 inches, with a breadth of 2 feet 11 inches. Another raceme measures 4 feet in breadth, but the height is somewhat less in proportion.

I believe I have leaves fully three feet in length, and about eight inches broad, but as I have not measured them I cannot speak positively. On one occasion I met with several plants of the *Musschia* in a ravine on the *south* side of Madeira, one of which—an extraordinary circumstance—was in full flower in the month of January.

Your obedient Servant,

NATH. H. MASON.

Selection of Woods *from the* Island of Madeira.

Mr. N. H. Mason, who has recently returned from Madeira, has a few Collections of the interesting Woods of that Island, consisting of Sections of Trunks of the following Trees :*—*Dracæna Draco, Euphorbia mellifera, E. piscatoria, Myrica Faya, Phœbe Barbusana, Persea Indica, Oreodaphne fœtens, Laurus Canariensis, Clethra arborea, Vaccinium Maderense, Sideroxylon Mermulana, Heberdenia excelsa, Picconia excelsa, Rhamnus glandulosa, Celastrus cassinoides, Ilex Juviado, I. Canariensis, Pittosporum coriaceum, Genista candicans, G. virgata, Visnea Mocanero.*

The average diameter of the Sections is about 10 inches, with a thickness of about 3 inches, but some are larger and some smaller than this.

Price, with the botanical and native names, and including excellent dried specimens of the flowers, fruit, and foliage, £5. 5*s.* 0*d.* the set. Specimens may be seen at Mr. Mason's chambers, 3, Red Lion Square. They could be cut to any form and size required. Mr. Mason's dried plants will be ready for distribution in September.

Mr. M. has a few living plants of *Musschia Wollastoni*, an exceedingly handsome new Campanulaceous plant; also of *Monizia edulis* and *Chrysanthemum hæmatomma*, from the *Dezertas*, all of which are described in the Number of this Journal for last October.

NOTICES OF BOOKS.

The Canadian Naturalist and Geologist; *conducted by a Committee of the Natural History Society of Montreal.* 8vo. (with Illustration). Montreal: B. Dawson. (Price 15*s.* per annum.)

This is the title of a bi-monthly periodical, conducted by J. W. Dawson, A.M., F.G.S., Principal of M'Gill College, T. Sterry Hunt, A.M., Chemist to the Geological Survey of Canada, E. Billings, Palæontologist, W. H. Kingston, M.D., and James Barnston, M.D., a

* We are in possession ourselves of the samples of trees, etc. here alluded to, and can testify that they are well worthy of the attention of all who are engaged in Botany and Horticulture.

Committee appointed by the Natural History Society of Montreal, Canada. The first number of the second volume (March, 1857), which we have just received, contains four geological, two zoological, and two botanical original articles, besides extracts from other periodicals, and, what more especially interests us, the Proceedings of the Botanical Society of Montreal. We may here at once mention that that learned body has determined to erect a suitable monument over the grave of Frederick Pursh, the author of the 'Flora Americæ Septentrionalis,' who it appears died at Montreal. Subscriptions may be placed into the hands of the Committee appointed for that purpose. (Address, J. G. Barnston, 40, Little St. James's Street, Montreal.) So little is generally known of Pursh, after he had completed his 'Flora,' that we are tempted to make the following extract:—"The success of his publication, and the interest excited by his discoveries, induced Pursh, under favourable auspices, further to prosecute his researches in the Canadas. He accordingly arrived in the Lower Province with the view of forming a complete herbarium of Canadian plants, of ascertaining the natural resources of the soil, and improving the system of horticulture. His labours however were not of long duration. After having explored a large portion of Eastern Canada, and made a considerable collection (subsequently destroyed by fire), he died at Montreal, on the '11th of July, 1820, aged 46 years,' so destitute of means that the expenses of his burial and other outlays were defrayed by his friends." This information we gather from the Proceedings of the Botanical Society, a source from which we also learn something about the "Botanical affinities of the fossil *Sternbergiæ*." "Professor Williamson," we are told, "has satisfactorily proved that some at least of the species are casts of the pith of trees of the Pine family, the Coniferous trees of the coal period having differed from our modern Pines in possessing large medullary cylinders." A publication of recent observations on the subject is promised by Professor Dawson. The two original botanical articles of which we have spoken are, "Remarks upon the Geographical Distribution of *Ranunculaceæ* throughout the British Possessions of North America," by George Barnston, and "General Remarks on the Study of Nature, especially Botany," by J. B. In the next issue, a paper on the "Algæ of Bermuda," by the Rev. A. F. Kemp, is to appear.—*B. S.*

Niger Expedition.—Dr. Baikie's *Second Exploring Voyage up the* Kwóra (Niger).

The information received from Dr. Baikie and Mr. Barter increases more and more with every succeeding letter, and as they approach the scene of their labours.

Of the intention of the Admiralty to send out another Expedition to explore the "Kwóra and Benue" (the Niger and Tsádda), under the command of the experienced and successful Dr. Wm. Balfour Baikie, R.N., and of the appointment of Mr. Barter to accompany it as botanist, we gave a brief notice at p. 122 of our present volume. In our last number, for August, are given extracts from the first letters that have been received from "Off Monrovia," from "Cape Coast Castle," and from "Fernando Po," the last of those letters being dated May 30th, 1857; and it was there mentioned that the arrival of the several cases of dried plants, fruits in alcohol, museum objects, living plants in a Wardian case, and a box of thirty species of *Orchidaceæ*, from Sierra Leone, were daily expected. The fate of these has been most unfortunate: they were embarked on board the 'Niger' steam packet-ship, belonging to the African Ship Company, which was wrecked, on its voyage to England, off the Canary Islands. Two out of four cases only appear to have been rescued, and those have reached us in a state of almost utter destruction; a few of the large hard seed-vessels and museum objects only can be preserved, though much injured by saturation in salt-water. The Wardian case scarcely shows a vestige of life in its contents, and the well-packed herbarium paper and specimens were a perfect mass of rottenness. All this is the more to be regretted, because the list of contents sent us by post shows that the contents of these cases were of no ordinary value; and, ruined as they are, it is easy to see that the collection was made and preserved with great judgment and patience. The herbarium specimens show that they were well selected, and every one was accompanied by a label, with name, notes, etc., made on the spot. It is a consolation to know that all that were collected up to the time of coming away were not despatched, many of the specimens not being sufficiently dry to bear the voyage; and further, that Messrs. Baikie and Barter have retained a duplicate set, and may have it in their power to visit some of the localities on their return from the Kwóra, and even at a more favourable (less

rainy) season of the year. Enough has reached us to show that, if life and health be spared, these zealous voyagers will contribute largely to our knowledge of the natural history of tropical Africa.

We proceed with the letters which we have recently received. The first is from Commander Baikie, dated—

Fernando Po, June 29, 1857.

Before leaving this place in the 'Dayspring' for the Niger, I must send you a final *résumé* of our labours hitherto. By this mail you will receive a cask of fruits, etc., preserved in spirits, all from this place, and of which a list is enclosed. There is also a case containing the remainder of our Sierra Leone specimens, and about 160 species from this place, all labelled. There are still here nearly 100 species, which, as they are not dry enough to send, we must take with us up the river. During this season, with the incessant heavy falls of rain which we have, there is often the utmost difficulty in drying plants, and Benthall's paper is of little or no use, as it absorbs moisture from the atmosphere, and gets soon quite rotten.

Capt. Babington, who touched here lately, and who desires to be remembered to you, left here the Wardian case of plants from Kew, in charge of the Consul, as he had no proper place for them at the Camaroons. Mr. Barter transplanted them, and those of which a list is enclosed are all doing well. The Consul being desirous of sending, by the return of this case, some plants to you, Mr. Barter undertook to select a few for the purpose, which are now in the case, and a list of which is also sent.

I also enclose some notes on two species of *Amomum*, common in this neighbourhood, for Mr. Hanbury's behoof. Mr. Barter is preparing some on the vegetation about Clarence, but they are not yet finished, so they must be sent at a future time.

I had intended writing on several points, but we have to be off in three or four hours. I have been at work since daylight, and still have much to see to and to complete, so I must conclude, more especially as I have had ague for two days, and am only just getting round.

W. Balfour Baikie.

Mr. Barter's letter, which we now give, probably (judging from the amount of botanical information) includes the notes on the vegetation about Clarence above alluded to by Dr. Baikie.

Clarence, Fernando Po, June 29, 1857.

When leaving Sierra Leone, I found a large proportion of the specimens but imperfectly dried, and totally unfit to pack and send by last mail. I regret to add that many of them are but slightly improved by their voyage down the coast, where we experienced the full force of the tornadoes which usher in the rainy season. My cabin was leaky; many specimens were spoiled, or rendered altogether useless. Such as are worth sending I now forward by this mail, with such additional species as I have been able to collect since on this island. By the same mail will arrive also a cask of fruits preserved in rum, which Dr. Baikie procured for me; some fine specimens of fruit of *Pandanus Candelabrum* are sent; also a bunch of native grapes, weighing 8 lbs. (*Cissus* sp.). Fruit and flowers of some *Kigelia*, and spathe of a gigantic aquatic *Aroidea*, with several smaller fruits, etc., indicated in the list which Dr. Baikie will enclose. In a dried state are a few other objects, Cola-nuts in clusters, etc.; flowers of this I have also gathered, and preserved in acid.*

I find it exceedingly difficult to dry plants in this climate; the wet season has set in, and during sunshine a close steamy vapour pervades everything under cover. Paper and books absorb moisture, and clothing gets covered with mildew. I find Benthall's soft porous paper useless here; it absorbs damp from the air, and speedily becomes rotten and useless. When the brown paper supplied by the Admiralty arrives, I shall probably manage better.

Heavy rains, and the density of the forests, have prevented me from reaching the interesting vegetation of the mountains. A journey of four to six miles from the sea, and with great difficulty, is all that I have been able to effect. The whole island might be said to be an impenetrable thicket of Palm-forest and lofty trees.

On the lower grounds, near the sea, *Elæis Guineensis* forms twenty-five per cent. of the forest-trees, and in some places occupies the ground almost

* In a letter addressed to Mr. Alexander Smith, Mr. Barter further observes of this: "The fruit grows in clusters, with leaves attached; it is not very abundant here, seldom more than one or two trees are found growing together, forming a small, branched, spreading tree, about twenty feet high. The natives keep the trees free of other wood, and offer the nuts for sale at Clarence, but never in a perfect state; the pod is slit longitudinally, either for the nuts to dry, or from superstition. Flowers I have looked for, but do not find them at this season. This is sent in a dry state."

exclusively. Many fine timber-trees, rising to the height of 150 to 206 feet, are visible from the glimpses obtained of the forest.

Huge white trunks of a tree called "Red-wood" are clearly perceptible on the sides of the mountains from Clarence, a distance of seven or eight miles. This wood is worked up for the internal fittings of the houses; it is rather hard, fine-grained, of a light red colour, polishes easily. *Bombax* attains a great size: its enormous buttresses, running half up the trunk, have a singular appearance. The African Oak (*Oldfieldia Africana*, Hook.) is said to grow here, and I have procured digitate leaves of a large tree, but have no further evidence of identifying it as that plant. The people undertake to find any tree when a name is given them, but no reliance is to be placed in them. Two fine trees are conspicuous in the forest by their elegant foliage, one with large peltate leaves, male inflorescence enclosed in spathaceous bracts, female on an ovate flattened receptacle, eventually becoming a yellow fleshy fruit, which is sometimes eaten: specimens dried and in spirits are sent. The other, in habit resembling a huge *Theophrasta*, with fine pinnated spiny leaves; flower or fruit not seen.

I will not say much on the specimens sent from here; most of the species are new to me, and I cannot fail to observe a great change from the species of Sierra Leone. The following plants are more or less characteristic of the vegetation near Clarence:—

Cocculus macranthus, its large, hairy, orange-coloured fruit is very conspicuous at this season; two weedy species of *Capparis;* one *Cleome*, in cultivated ground; *Abutilon* sp., with orange-coloured flowers; a large, shrubby *Hibiscus*, with yellow flowers, grows close to high-water mark, but only observed on the shore; *Sterculia Cola* is not an uncommon tree: I have sent clusters of fruit of this, pod and flowers preserved in acid: the trees never attain a large size, spread much, branching not unlike an English Apple-tree; *Glyphia grewioides*, common; *Melia Azedarach*, an introduced plant; the species of *Carapa* which I sent from Sierra Leone I have not seen growing here, although the nuts are plentifully washed ashore; the *Orange* and *Lime* have escaped to the woods, and now produce fruit abundantly in partially cleared places; a species of *Glycosmis*, with oblong, drupaceous fruit, is common; many species of *Cissus* abound in the deep shade of the forest, and produce clusters of tempting-looking fruit, some of which weigh from eight to twelve pounds, and would do credit to a grower of Hamburg grapes:

the pulp is sweet, but the seeds very acrid; of *Spondias* I have seen two species in fruit in the woods, both edible; *Leguminosæ* are very abundant in all forms, and as climbers are very numerous: a large tree of this Order, with beautiful *Mimosa*-like foliage, was pointed out to me as furnishing the large edible seeds known in the Eboe country as "Opòchala:" the great ligneous seed-pods I have sent dried, and living plants are placed in Consul Hutchinson's glazed case, for transit to Kew; *Entada*, *Mimosa*, *Indigofera*, *Desmodium*, *Phaseolus*, *Cassia*, climbing *Mucuna*, are common; one beautiful species of *Cæsalpinieæ* I have also gathered; *Rhizophora*, apparently two species, occur about the estuary of the streams, accompanied by *Avicennia Africana; Onagrariæ* are common in swampy places; *Jussiæa villosa*, and some species of *Isnardia; Melastomaceæ* are abundant as weedy plants; one beautiful species, bearing loose panicles of large, white fruit, occurs near Clarence; *Psidium pomiferum* most abundantly naturalized, forming eighty per cent. of the low bush near Clarence; large fruit of a *Napoleona* I met with at some distance in the forest, the leaves are different from *N. imperialis; Luffa scabra* is abundant in cultivated ground; a *Momordica*, with white flowers, and a fruit like *M. balsamina*, while some species, with globular fruit, hang from the trees over the streams; *Loranthus*, two species only have been gathered; *Rubiaceæ* are very abundant in shrubby forms, or as small trees; *Gardenia Stanleyana*, *G. Vogelii*, in the gloomy shade of the Oil-Palms; "Wild Coffee," near the sea only; *Heinsia jasminiflora*, *Mussænda Afzelii*, *M. tenuifolia*, may be everywhere seen from a boat, about the rocks in the numerous coves; a small *Cephaelis*, with *Geophila reniformis*, under Palm-trees; *Compositæ* not numerous as species; a shrubby *Vernonia* occurs, ten to fifteen feet high, grows near the sea; *Ageratum conyzoides* is a most troublesome weed in cultivated grounds; a species of *Bidens* is also common; a single representative of *Goodenovieæ* is seen, probably the *Scævola Guineensis;* the old ornament to our stoves, *Asclepias curassavica*, is established as an introduced plant; a beautiful species of *Spathodea* is just bursting into blossom, it appears to be the large, scarlet-flowered plant figured by Palisot de Beauvois in the 'Flore d'Oware et de Benin:' I transmit specimens in spirits, and have left directions for seeds to be secured after its flowering: looking out on the growing plant just now, at a distance of two or three hundred yards, it presents a truly gorgeous appearance; I send also the large, cucumber-like fruit

of some *Kigelia*, with flowers and leaves; the bark is used medicinally, but the fruit is said to be employed maliciously by the negroes on each other; one species of *Solanum* has been introduced here from Arrachi, and has now become the greatest pest in the island: several accidents have occurred from people eating the poisonous berries; we find a *Thunbergia*, a species of *Brillantaisia*, two *Eranthemums*, and a plant with leaves like *Acanthus mollis; Ocymum pilosum; O. Basilicum* takes a shrubby character, and produces woody stems of several years' growth; a species of *Teucrium*, called "Fever-bush" at Sierra Leone, is common here also; *Amaranthus paniculatus, A. spinosus*, are troublesome weeds; *Mirabilis Jalapa* is common here as elsewhere on the coast; a large, handsome, shrubby *Euphorbia* is abundant in the woods, an unarmed species, with obovate leaves; *Jatropha Manihot* is wild and cultivated: in the latter state the roots may be eaten raw with impunity, not having the slightest acridity characteristic of the American plant; *Microdesmia puberula*, a small tree, is common; the "Bush Pepper" of the markets on the coast is most abundant in the woods as a climbing plant; some *Pipers*, a few weedy forms of *Urticaceæ*, but no true Nettle; *Ficus*, as large trees and huge climbers, abound in the forest; *F. Brassi* I met only in the bay north of Clarence Cove; one singular *Dorstenia*, near Cape Bullen; I have gathered two species of Begoniaceous plants, one epiphytal, with flowers like *Begonia nitida*, the other a minute but beautiful object, with yellow flowers.

Of Palms I have seen but four species in this island: *Elæis Guineensis* forming the bulk of the vegetation on low grounds; *both sexes are occasionally found on one tree*, but it is more usually diœcious. The plant bearing only male flowers is the only one, as far as I have observed, from which the Palm wine is obtained. The reason assigned for not tapping the other is, that it does not yield such a flow of sap; probably reasonable enough, when the quantity of fruit it bears is considered. A species of *Calamus*, perhaps the one mentioned by Dr. Vogel, is a slender plant, fastening itself on other trees, by its barbed leaves, for support: a cluster of dried fruit I send home; another species, called "Bamboo Palm," is used for thatching houses, and is perhaps *Raphia vinifera;* Cocoa-nut is only seen at Clarence; *Phœnix spinosa*, so common in the Gambia, I have not seen here; *Pandanus Candelabrum* is plentiful in swampy places; fruit, section of wood, and seeds, I have forwarded to Kew. *Aroideæ* are most abundant; *Phyllodendron*, cover-

ing large trees in the forest; *Amorphophallus*, or some allied genus, abounds: I have also met with a very remarkable species in shallow lagoons or swampy places, having a spathe of great size, 2½ feet long, 1½ feet in circumference, green-striped on purple, rising from the water to the height of twelve or fourteen feet, petiole of the leaf and of the spathe covered with rows of sharp spines. Orchidaceous plants are probably more plentiful in the higher regions; *Ansellia Africana* is very common, as is also a species of *Galeandra*, on Oil-Palms, also a large-growing plant with the habit of a *Renanthera*, and some species of *Sarcanthus*. Scitamineous plants are very numerous, but in forms with which I am entirely unacquainted; some *Amomums*, as *A. Melagueta*, I have sent home; *A. Danielli*, or a plant agreeing with the description of that species, with the exception that its leaves are *ovate-lanceolate*, and *never cordate;* the Pine-apple is also very plentiful in the woods, but like the Orange, Plantain, and Banana, it has been planted there; Mosses and *Fungi* are common. But my list must terminate abruptly here, as we leave to-day, if the rain ceases, for the river. I append a list of the Ferns which are common, all of which may be gathered within half a mile of Clarence:—*Asplenium crenulatum, Drynaria irioides, D. vulgaris, Platycerium Stemmaria*,* *Tæniopsis lineata*,* *Trichomanes* sp.,* *Davallia elegans*,* *Asplenium falcatum*,* *Mertensia dichotoma, Gymnogramme calomelanos, Angiopteris evecta (?), Acrostichum aureum, Polystichum drepanum, Lygodium* sp., *Adiantum* sp., *Asplenium* sp., *Sitolobium* sp., *Pteris sulcata, Pteris* sp., *Antigramme* sp., three species, of genera with which I am unacquainted, and three of *Lycopodium.*

On board the small steamer 'Dayspring' our space is necessarily very small. After reaching the confluence of the rivers I hope to make such arrangements as will enable me to dry my plants, or at any rate place my paper below during these heavy rains.

List of Fruits and Specimens forwarded to Kew by Dr. Baikie and Mr. Barter, from Fernando Po.

In a cask of spirits.—No. 1. *Kigelia* sp., fruit, leaves, flowers. 2. *Amomum Danielli?*, fruit, flowers: the leaves of this species are *ovate-lanceolate, not cordate*, broad. 3. *Euphorbiaceæ?*, fruit. 4. Spiny fruit of a plant producing white flowers, growing ten feet high, of slender habit. 5. Fruit, male and female flowers, of a forest-tree thirty

* Growing on Oil-Palms.

feet high; leaves peltate, elegant. 6. Fruit, in large panicle, of a small tree with pinnate leaves, seldom more than eight to ten feet high. 7. Forest grapes, bunch weighing 8 lbs., probably some *Cissus*. 8. Fruit, flowers, and leaves of a forest tree. 9. Spathe, fruit, small leaf, and portion of flower-stem of a large aquatic Aroideous plant. 10. *Pandanus Candelabrum*, fruit and leaves. 11. *Cocculus macranthus*, fruit. 12. Cucurbitaceous fruit, globular, with its singular large cruciform stigma attached. 13. Small green-and-white spotted fruit from a small tree with large ovate leaves.

In bottles, not numbered.—Flowers and leaves of the Cola-tree. Flowers of a large scarlet *Spathodea*, and miscellaneous small fruits.

In a dried state.—Fruit of the Cola-tree, in clusters, with leaves attached. Ditto of *Napoleona Vogelii*, *Amomum Danielli*. Woods of forest climbers. Ditto of *Pandanus Candelabrum*. Fruit of *Kigelia* sp. Ligneous seed-pods of a Leguminous plant, seeds edible, called "Opòchala." Bark of the "Red-water-tree," used medicinally.

Dried specimens for Herbaria.—Remainder of specimens collected at Sierra Leone, about 300 species. From Fernando Po, only those sufficiently dry for packing, about 100 Phænogamous plants, a few Mosses and *Fungi*, and 40 Ferns.

Seeds.—From thirty to forty packets, including seeds of *Pandanus Candelabrum*.

Plants to be forwarded to Kew from Mr. Consul Hutchinson (glazed case).—*Panax* sp., producing large corymbs of scarlet flowers. *Amomum Melagueta* (two), roots obtained from a native village; the fruit, forwarded in spirit, was obtained from the plant sent. *Orchidaceæ*, one terrestrial species, producing white flowers of a singular shape; habit of plant resembling the British species *Epipactis grandiflora*. Leguminous tree of the *Mimosa* group, which produces the edible nuts called "Opòchala;" seed-pods of this are sent with dried specimens. *Tæniopsis* sp., from Oil-Palms. *Selaginella* sp., like *S. umbrosa*. *Selaginella* sp., a small neat species, very distinct from any previously seen under cultivation.

Notes on some EDIBLE *and* USEFUL AUSTRALIAN PLANTS, *in a Letter from* MR. CARL WILHELMI, *of the* Botanic Gardens, Melbourne, Victoria, *from a Letter addressed to the Editor of the 'Argus,' Melbourne.*

Sir,—I take the liberty of transmitting to you, for insertion in your Journal, should you think fit so to do, the undermentioned particulars concerning some indigenous plants, and which might prove both useful and interesting to many of your readers.

During my late botanical tour through the Grampians, Victoria Ranges, and Pyrenées, I have had opportunities of becoming acquainted with several plants which are of great use to the residents in those distant localities.

One of these is *Kennedya prostrata*, a Leguminous plant. Most of your readers interested in botany have doubtless observed a beautiful creeper, bearing red blossoms, and winding along amongst the grass, which is met with in large quantities about Melbourne, and in fact throughout the colony, and in full bloom in the months of October, November, and December. This plant is used by the wood-splitters of the Victoria Ranges as a substitute for tea, and has indeed a very agreeable taste. It is prepared in the following manner:—The creeper is rolled together into a ball, in order that it may be easy to put it into the pot. One or more of these balls are put into boiling water, the boiling is continued for two or three minutes, and the tea is made. For one quart-pot of water about one ounce and a half of this plant is required, which may be used either fresh or dried.

The leaves of *Acacia myrtifolia* (myrtle-leaved Acacia) are used by the same splitters as a substitute for Hops, and with success. The method of using it is the same as with common Hops.

It appears that in different districts different plants are used for one and the same purpose. For example, in the Dandenong district *Daviesia latifolia* is also being successfully used as a substitute for Hops. Both plants are met with in large quantities throughout the colony. In one district the residents are only acquainted with the use of the one plant, whilst in another district the other only is known as adapted for this particular purpose.

The *Droseras* are plants which have proved to be poisonous to sheep, though the fact is not yet generally known. If eaten by sheep,

they produce rapid death, and are met with throughout the colony in spring. Another plant, noticed by Dr. Mueller, *Gompholobium uncinatum*, is also very noxious to sheep.

In my travels in Port Lincoln (the western part of South Australia), in the years 1851 and 1854, I was frequently obliged to travel with natives, and had opportunities of making the following observations concerning their food obtained from the vegetable kingdom. The seed of all the varieties of the *Acacia*, which they call "Nundo," is gathered in large quantities, roasted in hot ashes, which makes it swell to double its former size, and then eaten. As a proof how valuable these fruits are to the natives, it may be mentioned that the Kukata tribe, living in the north-west, and renowned as very savage and possessing the art of sorcery, often threatens to burn the Nundo-bushes, or otherwise to destroy them, to harass the inimical tribes.

The roots of the *Scorzonera Lawrencii*, and of some Geraniaceous plants, are also roasted in hot ashes, and have an agreeable taste.

Two varieties of *Mesembryanthemum*, or Pig's-faces, which generally grow in abundance on the sandhills along the sea-coast, and have an agreeable flavour, are a favourite dish with the aborigines of the Port Lincoln district. On my tour of this year I saw the natives between the Grampians and Victoria Ranges eat the fleshy leaf of this plant with kangaroo-flesh, as a substitute for salt.

Another plant which is of great use to the aborigines is the *Nitraria Billardieri*, which grows in large quantities on high sandhills along the western sea-coast of Port Lincoln. The fruit is of the form and size of an olive, of a dark red colour, has a very pleasant taste, and is exceedingly cooling. In December and January the bushes are so full of fruit that the natives lie down on their backs under them, strip off the fruit with both hands, and do not rise until the whole bush has been cleared of its load. At the time above mentioned I travelled with five natives, who carried my collection of plants and my blankets on a very hot day through this arid country. All at once they threw off their loads, ran as quickly as they were able to one of these high sandhills, and disappeared amongst the bushes. Not knowing the meaning of all this, I followed them, and found the whole five as above described, lying on their backs under the bushes. I could not do better than do so likewise, and when we had refreshed ourselves we continued our journey.

The principal vegetable used for food by the Murray natives, near Swan Hill, is the root of *Typha Shuttleworthii*, native name "Gortong," or the common Bulrushes (properly Club-rushes, Ed.). With them it is a rule that all vegetable food is prepared by the women, whilst animal food can only be dressed by the men. The following is the mode of preparing this root. The women dig a hole, in which they keep a fire lit for some time, to heat the surrounding earth as much as possible. This being done, the fire is taken out, the bundle of roots is placed inside, covered over with earth, and a strong fire is then lit on the little eminence thus made. After about an hour has thus elapsed, they are taken out and distributed to those present. Of the chewed roots which are gathered in, they manufacture their nets, in which their nicknacks and provisions are carried. The women can twirl and twist the fibres of these roots on their legs to any length, and they then have the solidity and appearance of flax. Thus prepared, the root possesses no taste, but contains a great deal of starch.

The bark of the root of *Santalum persicarium*, a small variety of Sandal-tree, is roasted by the same tribe in hot ashes, and eaten, has likewise no taste, but is very nutritious. The native name for this plant is "Quantong." Dr. Mueller mentions this plant in his second Report.

On one occasion, when I was gathering herbs on the Murray, about seven or eight natives gathered round me in astonishment, not knowing why I should gather in these herbs. Eventually one of them asked the question, "What for whitefellow gathering grassy belonging to pullocky?"

Dr. Mueller, in his first report, mentions another valuable Tea-plant, and writes the following about it:—"*Backea utilis*, from Mount Aberdeen, might serve travellers in these desolate localities as tea, for the volatile oil of its leaves resembles greatly in taste and odour that of lemons, not without a pleasant, peculiar aroma."

I feel convinced that the vegetable kingdom of Australia has as valuable properties as that of any other part of our globe, and it would be very desirable that greater attention were paid to the economic and pharmaceutical branches of botany than has heretofore been the case.

I have the honour to be, Sir,

Your most obedient Servant,

Carl Wilhelmi.

Botanical Gardens, Melbourne, April, 1857.

On ASPLENIUM (§ Schaffneria) NIGRIPES, *a Mexican, and on* DAVALLIA NODOSA, *an Indian Fern; by* SIR W. J. HOOKER, K.H., F.R.A. and L.S. (TAB. IX. and X.)

1. ASPLENIUM (§ Schaffneria) NIGRIPES.

Parvula, radice fibrosa, stipite crasso nigro-ebeneo nitido, fronde obovata obtusissima integerrima glabra ecostata subçarnosa, venis anastomosantibus areolis elongatis subhexagonis, soris linearibus sparsis nunc 2 oppositis parallelis. (TAB. IX.)

Schaffneria nigripes, *Fée in litt. et Ic. Nouv. t.* 17. *f.* 1, *ined.* (*fide Moore in Ind. Fil. p.* liii.).

HAB. Between Vera Cruz and Orizaba, Mexico, *Fred. Müller*, n. 693; *Schaffner*.

DESCR. From a laxly tufted mass of villous fibres three to five small *fronds* arise, from 2 to 3, scarcely 4 inches high, including the stipes. *Stipes* about equal to the frond in length, or shorter, sometimes almost wanting, erect, strict, intensely black, ebeneous and glossy, compressed on one side, suddenly uniting with the base of the frond, by no means continuous with it, nor in any way forming a midrib to it. *Frond* broadly obovate, subflabellate, very obtuse, cuneate at the base, apparently deciduous at the summit of the stipes, quite entire, subcarnoso-coriaceous, thickest towards the base, and there very opaque, thinner and subpellucid towards the upper half, glabrous, ecostate, the margin slightly reflected; the *veins* subflabellate, anastomosing, but more decidedly in the upper portion; *areoles* elongated, subhexagonal. *Sori* mostly confined to the upper half, scattered, but sometimes approximate in pairs, each opening towards the centre of an areole and towards each other. *Involucre* narrow, linear.

This very remarkable Fern I had lately the pleasure to receive from Dr. Meisner, among an interesting collection made in Mexico by Dr. Fred. Müller. It has already however attracted the attention of M. Fée, for it is evidently the *Schaffneria* of that author's manuscripts and his published figure, according to Mr. Moore above quoted. The plant has a peculiar habit, in the thickened, black, ebeneous stipes, which seems jointed at its point of attachment to the frond (two of my specimens show that the frond is there deciduous): and the form of the frond is remarkable, as well as its thick and fleshy character, and certainly in the anastomosing venation, more distinctly reticulated in the

W. Fitch del et lith.

Vincent Brooks Imp.

Asplenium (Schaffneria) nigripes.

upper half towards the margin. Similar venation however appears in the genus *Ceterach* (where however the involucre is nearly obsolete), and in *Antigramma* of Presl, and to a certain extent in *Camptosorus* (*Asplenium rhizophyllum*, L.); and it may be a question, if the venation alone is taken into account as of generic importance, how far it might not be combined with some of them. With many authors we are aware that the quite entire frond would itself form a generic distinction. The sori are generally scattered and single in some of my specimens; in others in opposite pairs, opening towards each other as in *Scolopendrium*.

TAB. IX. Plants, *nat. size*. Fig. 1. Section of a sterile frond. 2. Portion of a fertile frond, seen from beneath. 3. Capsule:—*magnified*.

2. DAVALLIA (§ Microlepia) NODOSA.

Frondibus amplis membranaceis 3–4-pinnatis glabris siccitate nigrescentibus, pinnis inferioribus petiolatis plerumque oppositis horizontaliter patentibus omnibus ad basin magis minusve nodoso-dilatatis squamaque majuscula membranacea bracteæformi instructis, pinnulis parvis ovalibus vel oblongis 3–5-lobatis vel pinnatifidis, lobis obtusis unisoris, soro venulam terminante paulo intra marginem sito, involucro parvulo semiorbiculari membranaceo convexo demum patente, stipite longissimo robusto ad basin valde squamoso nitidissimo. (TAB. X.)

Davallia? nodosa, *Hook. Gen. et Sp. Fil.* i. *p.* 137. Davallia stipellata, *Wall. Cat. n.* 260. Aspidium nodosum, *Bl. En. Fil. Jav. p.* 171. Aspidium foliolosum, *Wall. Cat. n.* 359 ("?") *in part.* Acrophorus nodosus, *Presl, Tent. Pterid. p.* 93. *tab.* 3. *f.* 2. *Moore, Ind. Fil. p.* 3. Acrophorus stipellatus, *Moore, Gard. Chron.* 1854, *p.* 135.

HAB. Woods of the higher mountains of Java and the Moluccas, *Blume*. Nepal, *Wallich*. Khasia and Bootan, *Griffith* (*in Herb. nostr.*). Khasia, 5500 feet of elevation, and Sikkim, 7–10,000 feet, *Hooker and Thomson*.

DESCR. Entire specimens of this *Fern* are 4–6 or more feet long, including the stipes. *Frond* 2–4 feet long, broad-ovate in circumscription, 3–4-pinnate (becoming brown-black in drying), in the larger specimens almost supradecompound, lower primary *pinnæ* very long, often (the lowest pair especially) exactly opposite, brachiate, horizontally spreading; all the pinnæ very patent, petiolate, more or less swollen at

the base (probably more distinctly so in the living plant); and at this base is attached a rather large, membranaceous, ovate or subrotund, stipulary *scale*, which suggested to Dr. Wallich the appropriate name of *stipellata* to the species. Ultimate *pinnules* ovate and 3–5-lobed, or oblong and deeply pinnatifid, glabrous, but when young very minutely furfuraceous, cuneate at the base and decurrent, so as to form a narrow wing to the ultimate rachises; a slender zigzag sparsely pilose vein passes through the centre of this pinnule, sending out single *veinlets* towards each lobe, which terminate below the apex, and which bear the sorus at their points. *Sorus* rather small, globose. *Involucre* small, membranaceous, reniform, or nearly so when it covers the young sorus, attached by a broad base; afterwards it forms a half cup, covering only the lower portion or half of the sorus, in age becoming lax, very convex, and more or less patent or even reflexed, and in that state it may easily be mistaken for the involucre of a *Cystopteris;* almost justifying Link in uniting it to that genus. *Caudex* unknown to me. *Stipes* very long, often 2–3 feet, stout, thickening considerably towards the base, which is clothed with very large, ovate or oblong, brown, membranaceous scales, attached by a very broad base, waved, entire, becoming gradually fewer upwards, but a similar though broader and shorter scale is continued at the setting-on of the various pinnæ, and not unfrequently, in the younger specimens, seen at the base of the pinnules also. The *colour* of the stipes, as well as of all the numerous slender, strict, or slightly curved *rachises*, is a pale but bright brown, singularly smooth and polished.

I owe some apology to the public for the statement made under *Davallia ? nodosa* (Gen. et Sp. Fil. i. p. 157): "Of this plant I regret to say I know nothing, except from the remarks of Blume and Presl, and the figure of the latter author." It was my own fault that I was so ignorant; and it is as well at once to confess that, like its original discoverer (though not describer), Dr. Wallich, I had carelessly confounded it with *Diacalpe aspidioides*, Bl. (and Hook. Gen. et Sp. Fil. i. p. 59,—Aspidium foliolosum, *Wall. Cat.*). A note accompanying one of the specimens of this plant, from Dr. Wallich, should have taught me more caution:—"Sent home to the India House in 1823, as *Aspidium ? foliolosum*, Wall. Pray compare it with the other plant, and retain or reject the species accordingly." This remark, I need not say, indicates a close general resemblance to the *Diacalpe:* and fine authentic speci-

mens from the author (Dr. Blume) and from Dr. Miquel, of the *Aspidium nodosum*, Bl., and still finer from the late Mr. Griffith, from the Indian Company, and from Drs. Hooker and Thomson, with perfect fructifications, gathered in Khasia and Himalaya, have led me to a full investigation of the two Ferns, and to the conclusion that, however alike in general aspect the two plants may be, they are neither specifically nor generically the same.

Blume in 1827, Enum. Fil. Jav. p. 171, established his *Aspidium nodosum* upon a Fern found in Java, and next to it, same page, stands "*Aspidium subdigitatum*, n. sp.," with the remark, "Priori (*Aspid. nodos.*) simillimum, sed distinctum pinnis subalternis haud oppositis, rachi ad insertionem pinnarum haud nodosa, pinnulisque secundariis subdigitato-pinnatifidis."

The first of these two Ferns is taken up by Presl in his 'Tent. Pteridographiæ,' and a new genus constituted of it; *Acrophorus*, "Sori apici venularum superiorum insidentes, globosi, parvi. Indusium suborbiculatum puncto laterali inferiori affixum." And we have the further character: "Indusium primo sorum laxe obtegens, demum reflexum et corrugatum, ita ut capsulis absconditur." In this state it may well resemble a *Polypodium*. To very few authors does this species seem to be known. Guided by Presl's figure, probably, Link united *Acrophorus* with *Cystopteris*. Fée much more recently places *Acrophorus* among his "Genres et Sous-Genres non adoptés ou omis dans les synonymes," with the observation, "Nous n'avons jamais vu cette plante." In my 'Genera et Sp. Filicum' I referred Blume's plant, with doubt indeed, to *Davallia*. Moore, first in the 'Gardeners' Chron.,' 1854, p. 135, and since in his 'Index Filicum,' p. xci. and p. 1, not only preserves the genus *Acrophorus*, but modifies it, in order that it may include "*Leucostegia*, Pr., *Odontoloma*, J. Sm., *? Monachosorum*, Kze., *Davalliæ* sp., *Saccolomatis* sp., *Stenolomatis* sp., *Cystopteridis* sp., *Lindsææ* sp., *Microlepiæ* sp., *Humatæ* sp., *Dicksoniæ* sp.;" so that it numbers twenty-one species, the majority indeed included under *Davallia* in our 'Gen. et Sp. Fil.' Such a union of recently-found genera is indeed more consonant to our views than to those of Pteridologists of the present day, or than is consistent with the other very numerous genera enumerated in the same 'Index Filicum.' The author has assuredly rightly referred the *Davallia stipellata* to the original species *Acrophorus nodosus*: not so however with regard to the *Monachosorum davallioides*, Kze., Fil. Suppl.

p. 1. t. 101, *Polypodium davallioides*, Mett., and *Anagramma davallioides*, Fée, doubtfully placed as synonyms. These are one and the same plant, a *Polypodium*, according to our views, long ago and largely distributed by Dr. Wallich under the name of *Polypodium coniifolium*, Wall. (Cat. n. 326); the same as *Aspidium subdigitatum* of Blume, En. Fil. Jav., above alluded to (as I am assured by authentic specimens), considered by that author as very like his *Aspid. nodosum;* and the same species has recently been well figured and described by Dr. Blume himself, in his fine work, 'Floræ Javæ Fil.' p. 196. t. 93. The author remarks that he was led in the 'Enumeratio' to refer it to *Aspidium* from its general resemblance to his *Aspid. nodosum.*

On the whole I see no reason to regret my having placed our present plant in *Davallia* in the Gen. et Sp. Fil.; but I would incline to refer it to the *Microlepia* rather than the *Leucostegia* section (if there be any valid distinction between them). The affinity with *Cystopteris* confirms the correctness of the observation under that genus in Gen. et Sp. Fil. i. p. 197, namely that it (*Cystopteris*) may be considered a connecting link between the *Davalliaceæ* and *Aspidiaceæ*, harmonizing better with the former than with the latter.

Tab. X. Portions of a plant, *nat. size.* Fig. 1. Sterile portion of a frond. 2. Single fertile pinnule, and bracteal scale :—*magnified.*

BOTANICAL INFORMATION.

Flora of South Africa.

We announce with great pleasure that our valued friend Dr. Harvey, the able author of 'The Genera of South African Plants,' printed at the Cape in 1838, has it in contemplation to publish a complete Flora of that extensive Colony, and that he has already commenced the task. Such a work cannot fail to be of great importance to the colonists themselves, as well as to the scientific botanist; and all who have the means of contributing towards the perfecting of this work, by specimens or otherwise, will do well to communicate with Dr. Harvey, Professor of Botany, Trinity College, Dublin.

W Fitch del et lith

Vincent Brooks Imp

Davallia nodosa.

Mr. Wilford's *Botanical Mission to the Chinese Seas.*

It was considered by the Director of the Royal Gardens that the fact of the British Government sending a present of a splendid steam-yacht, 'The Emperor,' to the Emperor of Japan, might afford a good opportunity for making botanical researches among the numerous islands of the Japanese territories; and, through the kindness of Captain Washington, a memorial was laid before the Lords of the Admiralty, requesting that a botanical collector might be permitted to be present at the arrival of the yacht in Japan, and that such means might be afforded as would facilitate his exploring localities in the interior. The application was liberally responded to; a passage was at once offered in a Queen's ship to Hongkong, where he would remain botanizing till the 'Emperor' would call and convey him to Japan. A still further offer was made, namely that if it were thought desirable for the same collector to investigate the eastern coast of Tartary (Mandchouria), lying between the Strait of Coræa and the mouth of the Amour, a country celebrated for the production of Ginseng for the Chinese market, but otherwise its vegetable productions may be said to be wholly unknown to the scientific world,—the collector should be transferred to H.M.S. Actæon, now engaged in a survey of this coast of Tartary.

This granted, the next step was to provide the funds to meet the expenses of a competent collector, his salary, his outfit, etc.,—a duty kindly undertaken by the Right Honourable the Chief Commissioner of Works, the energetic head of the Royal Gardens, Sir Benjamin Hall, whose application to the Treasury for a three years' provision was readily responded to by a grant of £800. There was even less difficulty in finding a suitable collector: two of equal merit presented themselves, both of them herbarium assistants in the Royal Gardens of Kew, and the lot fell upon Mr. Charles Wilford, who had been for two years so employed. On the 2nd of May Mr. Wilford embarked for Hongkong on this interesting voyage, charged to form extensive collections, both of seeds and roots (and living plants, if they can be transmitted without too much risk) and herbarium specimens.

Mr. Wilford carries with him letters of recommendation to Sir John Bowring at Hongkong, and to the Admiral in the Indian Seas, Rear-Admiral Sir Michael Seymour; and we cannot doubt that every facility will be afforded by those gentlemen, which their high stations can

command. With our knowledge of the unfriendly feeling both of the Chinese and Japanese towards Europeans, and not least towards the English, we dare not flatter ourselves with the hope of entire success: but there is a wide field in the adjacent regions, and whatever hostility the Chinese may feel and practise towards us in their frequented harbours and great towns, it is a fact that the people in Eastern Tartary are very friendly disposed towards us, and even encourage intercourse with our people by all the means in their power.

Flora of the BRITISH WEST INDIAN ISLANDS; *by* DR. GRISEBACH.

In the present number of this Journal (witness the preceding article), and in many preceding ones, I have recorded with pleasure and pride the encouragement given in the present day to botanical science by our Government. It is now my agreeable duty to state that the Colonial Office has sanctioned the publication of a Flora of our British Colonies in the West Indian Islands, and has obtained a grant from the Treasury of £300 in aid of such publication. As the Colonial Office has liberally printed the correspondence respecting this transaction, to be circulated among the Governors and official gentlemen in those islands, with a view of conveying the information to them, and requesting their aid towards the greater perfecting the work, we cannot but desire to give it further publicity through the medium of our pages.

Letter No. 1. *Sir W. J. Hooker to the Right Honourable the Principal Secretary of State for the Colonies.*

Royal Gardens, Kew, May 14, 1857.

Sir,—The aid and encouragement given to the Royal Gardens of Kew, on various occasions, and to the Botanic Gardens in our Colonies, by the Right Honourable the Principal Secretary of State for the Colonial Department, encourage me to make the following proposition to Mr. Secretary Labouchere.

Botany is not now what it once was, a science confined to the learned, and of little or no benefit to the people at large. In the present day, as is well known, it has a practical bearing on numerous trades and professions; and a familiarity to a certain extent is of essential consequence. Not a day passes that we have not, at Kew, applications made

from individuals for information respecting the *products* of plants, of gums, resins, drugs, dye-stuffs, timbers, ornamental woods, fibres for paper and clothing, etc. etc., which information can at present only be obtained from our Gardens and our Museum of Economic or Practical Botany. But we are ourselves often deficient in many of the plants and products of plants, even of our own possessions abroad; and our colonists and travellers in our colonies repeatedly and anxiously inquire, but in vain, what book they can consult on the countries they are about to visit. To the honour of the Colonial Office, the first Colonial Flora that ever appeared, namely that of "British North America," was published in 1840 (by myself), under the authority (and at the expense) of "the Secretary of State for Colonial Affairs." This was the result of the several journeys and voyages undertaken to explore the more northern and western territories, by Franklin, etc. etc., and appeared in two volumes quarto, with 240 plates, and an excellent map of all the British possessions. Since then, a valuable Flora of the "Falkland Islands," and of our "Antarctic Possessions;" another of "New Zealand," and now of "Van Diemen's Land," have appeared. These, in quarto, with numerous plates, maps, etc., have all been published by Dr. Hooker, "under the authority" (and at the expense) of "the Lords of the Admiralty." But these, valuable and important as they assuredly are, are on too expensive a scale to be generally useful. What I would venture to suggest is, a work in octavo, without plates, scientific yet intelligible to any man of ordinary education; and the country that I particularly have in view, is the *British West Indian Islands*, so rich in useful vegetable products. I have reason to know that a very able botanist, Dr. Grisebach, is only deterred from publishing this Flora, by the fact that such works are not remunerative to the author, who is necessarily put to a great expense in the preparation. This Flora should appear in two volumes octavo, each of about 500 pages. To secure the author from positive loss, a sum of £300 would be required; and then, and only then, he would be justified in carrying out the publication. How far the Right Honourable the Secretary for the Colonies may deem it right to provide such a grant, must be left to his honourable consideration and judgment.—I have, etc.,

(Signed) W. J. HOOKER, *Director*.

Letter No. 2. *C. Fortescue, Esq., to Sir W. J. Hooker.*

Downing Street, June 12th, 1857.

Sir,—I am directed by Mr. Secretary Labouchere to acknowledge the receipt of your letter of the 14th ultimo, suggesting that a sum of £300 should be granted by her Majesty's Government in aid of the publication of a work to serve as a Flora of the West Indies, by Dr. Grisebach.

Mr. Labouchere has much pleasure in informing you, that the Lords Commissioners of the Treasury have acceded to his recommendation that a sum of £300 should be sanctioned for this service.

I am to transmit to you the enclosed copy of a letter from the Lords Commissioners, and to request that you will make any suggestions you may have to offer as to the payment of the money, and the superintendence of the work.—I remain, etc.,

(Signed) C. Fortescue.

Letter No. 3. *James Wilson, Esq., to H. Merivale, Esq.*

Treasury Chambers, May 27, 1857.

Sir,—Having laid before the Lords Commissioners of her Majesty's Treasury your letter of the 20th instant, transmitting copy of a communication from Sir William Hooker, in which he suggests that a sum of £300 should be granted by her Majesty's Government in aid of the publication of a work to serve as a Flora of the West Indies, by Dr. Grisebach, a botanist, whom Mr. Labouchere understands to be well and favourably known to the scientific world.

I am directed by their Lordships to acquaint you, for the information of Mr. Secretary Labouchere, that my Lords approve of a contribution, on the part of the public, towards the expense of the proposed work, of a sum of £300; and they will cause the requisite provision to be made for this amount, in the Estimate for Scientific Works and Experiments.

Their Lordships request to be informed in what manner Mr. Labouchere would recommend this sum to be issued, and under whose superintendence it should be applied, to secure its being made available in the most economical manner, in the publication of the work.

I am, etc.,

(Signed) James Wilson.

Letter No. 4. *Sir W. J. Hooker to C. Fortescue, Esq.*

Royal Gardens, Kew, June 16, 1857.

Sir.—I have the honour to acknowledge your obliging communication of the 12th instant, informing me that the Lords Commissioners of the Treasury had acceded to the very kind recommendation of Mr. Secretary Labouchere, that a sum of £300 should be granted by her Majesty's Government in aid of the publication of a work to serve as a Flora of the British West Indies, by Dr. Grisebach. This letter is accompanied by a copy of a letter from the Treasury Chambers, sanctioning the same, and causing the requisite provision to be made for the amount in the estimate for Scientific Works and Experiments.

I am desired by your letter to make any suggestions I may have to offer as to the payment of the money, and the proper superintendence of the work.

In regard to the payment of the money, or the mode and times of payment, I would take leave to suggest, that as the work is to be in two volumes octavo, I think it would be just and fair, and would entirely meet Dr. Grisebach's wishes, if the sum of one hundred pounds (£100) be drawn as soon as the first volume of manuscript be completed, and placed in the printer's hands; and if the remaining £200 be paid on the day of publication of the whole.

In regard to the superintendence of the work, if agreeable to Mr. Secretary Labouchere, I shall be most happy to undertake that duty myself, as I cannot but feel great interest in a work which will tend so much to make known the vegetable resources of our possessions in the West Indies, and for the preparation of which Dr. Grisebach is so eminently qualified, by his scientific and practical knowledge.

I have, etc.,

(Signed) W. J. Hooker, *Director*.

Letter No. 5. *H. Merivale, Esq., to Sir W. J. Hooker.*

Downing Street, July 23rd, 1857.

Sir,—With reference to your letter of the 16th of June, regarding the mode and times of payment to Dr. Grisebach, of the sum of three hundred pounds (£300), which has been sanctioned by the Lords Commissioners of the Treasury, in aid of the publication by that gentleman of a work to serve as a Flora of the West Indies, I am directed by Mr.

Secretary Labouchere to acquaint you that their Lordships have stated that they have no objection to the course proposed in your letter.

I am, etc.,

(Signed) HERMAN MERIVALE.

Letter No. 6. *Sir W. J. Hooker to the Right Honourable the Principal Secretary of State for the Colonies, to be printed and forwarded to the several Governors and Official Gentlemen in the West Indian Islands.*

Royal Gardens, Kew, June 16th, 1857.

Sir,—The increased and increasing demand for textile substances derived from fibres of plants, for woods (whether for timber or ornamental work), gums, resins, dye-stuffs, drugs, and other useful vegetable substances, renders a knowledge of plants and their properties and products of the highest importance to persons interested in our Colonies. This has been felt and acknowledged in those few countries of which a Flora has yet been published. The Secretary of State for the Colonies in 1840 was the first to encourage the publication of a Colonial Flora, viz. that of British North America, from the collections made at different times at the public expense, and the 'Flora Boreali-Americana' was the result.

That precedent has been recently followed in regard to the proposed Flora of *Jamaica and the British West Indian Islands*, for which her Majesty's Government have liberally promised a grant of £300, and the author is at this moment engaged in preparing for its publication.

Already our own herbaria are rich in plants of these islands, many of them still waiting scientific description; and a large number of useful vegetable products will be more fully made known to the public on the completion of the proposed work.

Still there is every reason to believe that by continued researches more new plants and more useful products will be detected; and the object of the present application is to ask whether you will be pleased so far to sanction the accompanying Circular, or any modification of it, as to allow it to be sent officially to the Governors of the respective Islands, *possibly accompanied by a recommendation from the Secretary of State, that for the sake of the Colony and of Science, it may meet with attention.*

I have, etc.,

(Signed) W. J. HOOKER, *Director.*

P.S. Many gentlemen connected with Jamaica and the British West

Indies, having expressed an anxious desire for the publication, in an inexpensive form, of a Flora of that interesting and fertile group of islands, Her Majesty's Government, with a view to encourage such a work, have granted a sum sufficient to meet the expenses of authorship thereof; and Sir William Hooker has undertaken that, from the large collections of West Indian plants in his own Herbarium, and in the Herbaria of the Royal Gardens of Kew, in the British Museum, etc., such a work shall forthwith be prepared.

To render the publication however more complete, the Governors and official gentlemen of the islands are requested to lend their powerful aid towards the more perfect completion of the work in question, by encouraging all interested in the subject to collect further materials, whether in the form of *dried specimens* (for the Hortus Siccus) or for *cultivation* in our stoves, together with the various useful vegetable products for the Museum, according to printed instructions which accompany this circular.

Letter No. 7. *Copy of a Letter from the Colonial Office, which accompanied the above correspondence, addressed to the Governors, etc.*

Downing Street, June 29th, 1857.

Sir,—I transmit to you the copy of a Letter from the Director of the Royal Gardens at Kew, requesting that the attention of the Governors of the West Indian Colonies may be called to the accompanying Circular, relative to the transmission of Plants from those Colonies to the Gardens. I also transmit, for your information, copies of Correspondence with Sir William Hooker, from which you will see that a grant of £300 *has been sanctioned by her Majesty's Government in aid of the publication of a work by Dr. Grisebach, to serve as a Flora for the West Indies.*

I have the honour to be, etc. etc.

Finland Bread.

It appears that there has been a season of great distress in the spring of the present year (1857), for want of a sufficiency of food in the northern provinces of Finland. Samples of the bread employed have been obligingly sent by the Board of Trade to the Museum of Economic Botany at Kew, together with copy of the following letter,

addressed by H.M. Consul, H. W. Crowe, to the Earl of Clarendon, dated—

British Consulate, Helsingfors, 16th June, 1857.

My Lord,—The reports which from time to time have found their way into our public journals, with regard to the scarcity of food in the northern provinces of Finland, have not been exaggerated, and in the early part of the spring of this year the distress was so great that the peasantry were forced to live on bread made of bark, and several cases of death by starvation took place.

The Imperial Government has lately sent three students from the University of Helsingfors to teach the inhabitants how to bake bread from Iceland Moss (*Lichen Islandicus*) and Reindeer Moss (*Lichen rangiferinus*), mixed with Rye, samples of which I have taken the liberty to forward on to your Lordship, under care of the Legation at Stockholm, as they may probably prove of interest.

Subscriptions took place very extensively, not only in Russia and Finland, for the relief of the poor, but also very largely in Sweden and England, so that for the moment the requirements have heen supplied; but the authorities look with considerable anxiety to the result of this harvest, as up to this time the appearances are not of the most promising description, and should they fail, the result will be most distressing, and the inhabitants inevitably exposed to greater misery than what they experienced last winter.

I have, etc.,

(Signed) H. WOODFALL CROWE, *Consul.*

Note on the Cultivation of the GUINEA-GRASS (Panicum frumentaceum), *in* Malta; *communicated by* GOVERNOR REID *to* Mr. Secretary Labouchere, *of the Colonial Office.*

From inquiries which I made on first coming to Malta, I was assured that the Guinea-grass was unknown here; I therefore procured a box of plants from Barbadoes, five roots of which only arrived here alive.

These five roots were soon multiplied to many thousand plants, and I have had the pleasure of introducing it into the island of Sardinia, the province of Tripoli, into Corfu, and different parts of Greece. Its

value in these latitudes is greatly enhanced from the Guinea-grass commencing to flourish with the heats of summer which burn up all native grasses. I am now sending a further supply of plants to the Consul-General and Vice-Consul at Tripoli, Colonel Herman and Mr. Reade, who are growing it there successfully, and are in hopes it may succeed even in some parts called "Desert," where its roots can reach moisture.

I have since its introduction here been informed that the French attempted for many years to grow it in the south of France, a climate probably too cold for it, but that it has been long known in Tunis. After it multiplied here, I found there had been a root in the Island, carefully preserved for thirty years as a curiosity, but never propagated. From whence it came is now unknown.

The most interesting experiments with the Guinea-grass in this part of the world are those making in the low moist lands of the island of Sardinia, and in the deserts of Tripoli. This tropical grass came originally from the coast of Guinea, and may succeed better as it is carried south from the coast of Barbary. In Greece and in Corfu it will probably be killed by frosts.

WM. REID, *Governor.*

Palace, Valetta, June 5th, 1857.

Results of the Trade in Palm Oil *(Elæis Guineensis) and* African Ground-nuts *(Arachis hypogæa), on the West Coast of Tropical Africa.*

A statement to the following effect has recently (July 5th, 1857) appeared in the 'Times' newspaper, being the signature of "M. Forster, New City Chambers."

"Having been intimately and largely connected for half a century with the trade of the West Coast of Africa, I can state, upon my own knowledge, that with the repression of the Slave-Trade, the moral and social condition of the people has continued to improve. So, too, has legitimate trade become a substitute for dealing in slaves. When I was first connected with the African coast, our importation of African produce was next to nothing. For one tun of Palm Oil then imported, I may safely say we now get 200. At that period few persons ever heard of a trade in African Ground-nuts; but at this time no less a quantity than from 50,000 to 60,000 tons are annually exported to France,

America, and this country. The yearly value of Palm Oil and Groundnuts alone received in Europe and America, from the coast of Africa, represents three millions sterling. So much for merely two articles of African produce, brought into commercial existence by the Abolition of the Slave-Trade."

NOTICES OF BOOKS.

I. FÉE, A. L. A.; *Exposition des Genres de la Famille des* POLYPODIACÉES (*Classe des* FOUGÈRES). (*Extrait des Mémoires de la Société d'Histoire Naturelle de Strasbourg.*) 4to, 36 pages. 1850.

II. FÉE, A. L. A.; *Mémoires sur la Famille des* FOUGÈRES.

1. *Premier Mémoire: Examen des bases adoptées dans la Classification des* FOUGÈRES, *et en particulier de la nervation.* Large folio. Strasbourg, 1844. Two Plates, numerous figures of nervation, etc.
2. *Deuxième Mémoire: Histoire des* ACROSTICHÉES. Large folio, with Sixty-four Plates. A Monograph of *Acrostichaceæ.* (These two Memoirs are in one.)
3. *Troisième Mémoire: Histoire des* VITTARIÉES *et des* PLEUROGRAMMÉES; and
4. *Quatrième Mémoire: Histoire des* ANTROPHYÉES. Large folio. (These two Memoirs also in one.) Paris, 1851–52. Five Plates, several species on each plate.
5. *Cinquième Mémoire.* GENERA FILICUM. *Exposition des Genres de la Famille des* POLYPODIACÉES. 4to. Paris and Strasbourg, 1850–52. (The most important of all the works of this Author, if not of any, on Ferns.)
6. *Sixième Mémoire: Iconographie des Espèces nouvelles, décrites ou énumérées dans le* GENERA FILICUM. 4to. Eight Plates, and several figures on each plate. (No date or separate title-page, unless the wrapper contained them, which has been removed from our copy in the binding.)

III. SMITH, JOHN; *Catalogue of the* FERNS *in the Royal Gardens of Kew.* Privately printed, for the purpose of making exchanges with other Gardens.

IV. SMITH, JOHN; *Cultivated* FERNS; *or, a Catalogue of Exotic and Indigenous* FERNS *cultivated in British Gardens, with Characters of the Genera, principal Synonyms, etc.* 12mo, 84 pages. London: Pamplin, 1857.

V. MOORE, THOMAS; INDEX FILICUM: *a Synopsis, with Characters of the Genera, and an Enumeration of the Species of* FERNS, *with Synonyms, References, etc.* 12mo. London: Pamplin. 1857. Nos. 1, 2, 3.

VI. METTENIUS, DR. GEORG; FILICES HORTI BOTANICI LIPSIENSIS. Folio. Leipzig, 1856. Thirty Plates, with many figures on each plate.

VII. METTENIUS, DR. GEORG; *Ueber einige* FARNGATTUNGEN. I. POLYPODIUM. (*Abhandl. d. Senckenb. Ges. Bd. II.*) 4to, 138 pages. Three Plates, with numerous figures. (No further title nor date.)

We have here brought together the titles of not a few very recently published writings, which cannot fail to interest all students and lovers of *Ferns*, and which will in a greater or less degree contribute towards that long-sought desideratum, the fixing upon an arrangement of this very extensive and beautiful family, which shall be consistent with nature, and practically useful to such as desire to possess a knowledge of the genera and species. Those who have devoted most attention to the *Ferns* know that *that* is at present far from being the case; on the contrary, they cannot make use of the majority of works enumerated above, without seeing and regretting the different views that are expressed by authors upon both genera and species, and without being almost driven to despair at the mass of synonymy collected under each genus and species. Few Ferns, as Mr. J. Smith justly observes, "possess less than two names, many have more, and not a few even exceed twenty." In some, and in no small, degree, this "maze of conflicting views" arises from the very variable character of *species*, or from the necessity of consulting imperfect descriptions, which are often made from imperfect specimens, and which we may look to be corrected by a more intimate acquaintance with, and a careful comparison of, numerous specimens, especially in a living state. This the continually increasing taste for cultivating them renders happily more and more practicable. But who shall pretend to settle the limits of *genera?*

It is far however from our intention or wish, on the present occasion, to criticize the views of the several works now under consideration, even had we greater confidence than we have in the soundness or stability of our own views, which are certainly at variance with the present passion for making new genera. We shall rather undertake the more grateful task of saying a few words in favour of much that is good in them.

As the most important of the works that stand at the head of this notice, we must assuredly rank those of M. Fée, the most learned Pteridologist of the present day or of any former time. Considering the amount of his genera, 181 in *Polypodiaceæ* alone, and the necessity for a multiplicity of divisions and subdivisions, his arrangement is good, well considered as to natural affinity, and his definitions are clear and intelligible. Every part of the plant is taken into account in the formation of genera; and, as may be expected, great stress laid upon the importance of venation as a distinguishing feature in their characters. The plates are numerous, often beautiful, and, in general, extremely accurate. Examples of nearly the whole of the genera adopted by him are figured, accompanied by ample analyses. These, no less than his figures of species in his Monographs of *Acrostichaceæ*, *Vittarieæ*, *Pleurogrammeæ*, and *Antrophyeæ*, together with his 'Iconographie des Espèces nouvelles,' are of the greatest value to the student of Ferns, and teach him more than all the most laboured descriptions can do. M. Fée has reason to be proud of the services he has rendered to Pteridology, and his works will never cease to be referred to for the multitude of accurate figures of the plates, and the new views and ideas elicited in the descriptive portion.

Mr. J. Smith, the author of the Articles III. and IV., has been long known in the botanical world for the very extensive collection of Ferns he has brought together in the Royal Gardens of Kew, chiefly imported through his influence, and successfully cultivated by his unwearied care; and no less known for the great extent of his own private Herbarium of Ferns, both of which collections he has studied with great perseverance. The valuable results have been on various occasions laid before the world, especially in the tract on "The Arrangement and Definition of the Genera of Ferns," published in our Journal of Botany for June and July, 1841. Almost at the same time with Presl, and without any knowledge of what the other was engaged upon, these two writers

published an arrangement of Ferns, founded mainly upon the venation, to an extent which never had been before employed, and which may be said to be the groundwork of almost every subsequent treatise on this branch of Fern-study. Article III., though simply a "*Fern Catalogue of Kew Garden Species*," is arranged on this principle, has been eagerly sought after by cultivators, and has given rise to the more important one, Article IV., also by Mr. J. Smith, published by Pamplin, and entitled '*Cultivated Ferns, or a Catalogue of Exotic and Indigenous Ferns cultivated in British Gardens.*' This is prefaced by introductory remarks, a few pages of definitions, and, what has been much wanted, there are characters given of the Orders, Tribes, Divisions, and Genera. A more useful manual for all who cultivate Ferns, or take an interest in them, cannot well be, unless it were by its being accompanied with brief specific characters also. It is indeed a cheap shilling's-worth, and we trust that Mr. Pamplin, who, as a publisher, has done much to promote the study of Ferns, will meet with the success in the sale of this little book of eighty-one pages, with Index, which he deserves.

Article V. is Mr. Moore's '*Index Filicum*,' Nos. 1, 2, and 3.

We announced the appearance of the first Number, or Part, as it is called, of this publication, so useful to the many students and cultivators of Ferns, at p. 124 of this volume. The second and third Parts are now before us: in the last one the enumeration and characters of the genera are concluded, the number of such genera counting 182. The Index of Species follows upon this, and is intended to include, in alphabetical order, the names of all the *Genera* and *Species;* those which are synonyms in a different type, referring them to the respective genera and species, which, in the views of the author, should be adopted, under which are given the localities and full synonyms and references to figures. Of the execution of this portion of the work, we shall be able to form a better judgment as it proceeds; for, as we have already stated, the difficulties to be encountered are great, if for no other reason, because a multiplicity of species are only known to those who have, too often *imperfectly*, described them. As far as is present published, the Index goes no further than "*Adiantum*," and in species only to the commencement of the letter *d* (Adiantum *d*enticulatum). Twelve out of the twenty-four pages of the Index are devoted to *Acrostichum*, and more than six to *Adiantum*,—genera which have been

recently tolerably well elaborated by other authors, and the labour of them is consequently very much diminished.

Articles VI. and VII. are the last on our list, and are from the pen of the present Professor of Botany and Director of the Botanic Garden at Leipzig, the able successor of a very distinguished Pteridologist, Professor Kunze. Here too, in Article VI., under the unassuming title of '*Filices Hort. Bot. Lipsiensis*,' is a great amount of information and a most extensive suite of figures, illustrative of the structural nature of Ferns, especially as regards the venation; not only derived from cultivated specimens, but from a great number of species and genera only known in herbaria, added, as it were, supplementarily to the garden species. The result of this author's studies however leads to conclusions the very opposite of the views entertained by the preceding authors here mentioned, for he combines a great many modern genera and invents a great number of new terms for his divisions and subdivisions, which stand in need of explanation. This is, no doubt, fully given in the preface, which occupies between eleven and twelve closely printed folio pages, unfortunately in German, which renders them sealed pages to us; a very great number of the remarks too on genera and species in the body of the work are in German.

As an illustration of his method, we may observe that he reduces *Acrostichaceæ* to five genera, of which *Acrostichum*, Linn., is the first, and this has seven divisions or sections, under the following titles:—

§ 1. *Cœnopteris* et *Cyclopteris* (includes the genera Rhipidopteris, *Schott*, and Microstaphyla, *Pr.*).

§ 2. *Neuropteris*, *Tæniopteris*, vel *Eupteris* (Elaphoglossum, *Schott*).

§ 3. *Doodya*, *maculæ pluriseriatæ*, *subflabellatæ* (Anetium, *Pr.*).

§ 4. *Lagenia* (Leptochilus Linnæanus, *Fée*).

§ 5. *Doodya appendiculata* (Leptochilus, *Kaulf.*).

§ 6. *Drynaria subregularis* (Leptochilus, *Bl.*).

§ 7. *Nervi palmati; maculis Doodyæ appendiculatis junctæ* (Gymnopteris Vespertilio, *Hook.*).

His second genus is *Dryostachyum*, J. Sm.; his third, *Olfersia*, Raddi; fourth, *Chrysodium*, Fée, Acrost.; but assuredly not restricted to Fée's species, which are exclusively *Acrostichum aureum* and its allies (or varieties); whereas Mettenius includes *Acrost. crinitum*, Sw. (Hymenodium, *Fée*); and a group called *Lomariopsis*, which embraces that genus of Fée, *Photinopteris*, J. Sm., *Jenkinsia*, Hook., etc. These and

the other genera of the work have the names of other genera of authors (often more than one) employed as divisional characters, but the prefatory remarks only can explain the exact sense in which they are used.

Article VII., from the pen of the same author, is a very valuable enumeration and revision of the genus *Polypodium* of Linnæus, we presume, but excluding *Phegopteris*, and including species of *Grammitis* and other *Nudisori*, with elongated fructification, accompanied for the most part with specific characters, synonyms, etc. The number of such species here given is 268. A very full Index completes the work.

Grisebach, Professor A.; Plantæ Caribeæ; *or, Systematische Untersuchungen über die Vegetation der Karaiben, insbesondere der Insel Guadeloupe.* 4to. Göttingen. 1857. (From the seventh volume of the 'Abhandlungen der Königlichen Gesellschaft der Wissenschaften zu Göttingen.')

Great as has been the intercourse between Europe and the Caribbean Islands, and notwithstanding the researches of Sloane, and Plumier, and Brown, and Swartz, and Jacquin, to say nothing of more recent botanists, Bancroft, Wright, M'Fadyen, Purdie, Alexander, etc., we may say with truth that more is known of the plants of Australia and Tasmania and New Zealand, than of these fertile islands, which lie nearer to us, and are more accessible than any tropical region of the world. Swartz's 'Flora Indiæ Occidentalis' only includes the gleanings of a few islands; M'Fadyen's 'Flora of Jamaica' had scarcely reached beyond the *Leguminosæ* in De Candolle's arrangement, when the author was cut off by death, and very little manuscript had been prepared by him beyond that family; and the 'Flora of Cuba' of Don Ramon de la Sagra has in like manner been discontinued before it was half completed.

Dr. Grisebach, the able Professor of Botany in the University of Göttingen, has recently had the good fortune to become possessed of a considerable herbarium of specimens, collected in Guadeloupe by M. Duchassaing. Of these, with some additions, a Catalogue is published, with synonyms and remarks of known species, and specific characters of new species, accompanied with observations and habitats. The species thus enumerated amount to 1486, including Ferns.

It is the preparation of this work that pointed out Dr. Grisebach as eminently qualified to publish a more extended Flora of the same region, namely that of the British West Indian Islands, as will be found announced in another part of this month's Journal.

Reichenbach, H. G., Fil.; Xenia Orchidacea.

Since our notice of the early numbers of this important work, the 5th to the 9th Fasciculi have appeared. We find the same degree of pains in the descriptive matter, and in the figures and analyses, as were so evident in the former numbers; and species of the following genera are especially illustrated; *Nasonia*, *Lockhartia*, *Fernandezia*, *Colax*, *Sobralia*, *Stanhopea*, *Brassia*, *Cœlogyne*, *Miltonia*, *Epidendrum*, *Lepanthes*, *Odontoglossum*, *Chrysocycnis*, *Pachyphyllum*, *Hexadesmia*, *Restrepia*, *Pleurothallis*, *Stelis*, *Lælia*, *Selenipedium*, *Oncidium*, *Leucomormium*, *Pescatorea*, *Batemania*, *Bollea*, *Maxillaria*, *Zygopetalum*, *Masdevallia*, *Phajus*, *Tæniophyllum*, *Ceratochilus*, *Louisia*, *Calanthe*, *Diglyphosa*, *Acinetia*, *Ornithidium*, *Dendrocolla*, *Salacistis*, *Monochilus*, *Nephelaphyllum*, *Pholidota*, etc., etc.

As in the 'Icones Floræ Germanicæ,' two, and more species, are not unfrequently given on one plate. Indeed, it is a work that commends itself to every botanist, and no less to the numerous cultivators of Orchidaceous plants.

Visiani, Professor Rob. de'; *Illustrazioni delle Piante nuove e rare dell' Orto Botanico di Padova.* Memoria III. 4to. Venezia, 1856. (From the sixth volume of 'Memorie dell' Instituto stesso.')

Eleven new species, of nearly as many different genera, are here carefully described by the celebrated Professor of Padua: but what adds greatly to the beauty and value of this Memoir, is the very charming figures of three of the plates, with admirable analyses of three of the most difficult subjects, viz. *Pinus Parolinii*, Vis., *Juniperus Bonatiana*, Vis., and *Juniperus Cabiancæ*, Vis., from the pencil of La Sig. Elisa Parolini, now the accomplished lady of J. Ball, Esq., late under-secretary in the Colonial Office.

Enumeration of the Mosses *collected in* India *by* Dr. J. D. Hooker, F.R.S., *and* Dr. Thomas Thomson, F.R.S., *with their habitats, elevations, and the numbers under which they have been distributed; arranged by* W. Mitten, Esq., *and named by* W. Wilson, Esq.

I. Acrocarpi.

No. 2. Andreæa *petrophila*, Ehrh.—Hab. Sikkim-Himalaya subalpina; Lachen, alt. 12,000 ped., J. D. H.

6 *d. Id.*—Hab. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

3 (*a*). Var. foliis acutis? (*A. ambigua*, Wils. MSS.), vix *alpestris*, Bryol. Eur. (*aa*), large state of (*a*). (*c*), ditto. (*b*), same as 2?.—Hab. Sikkim-Himalaya alpina; Tunkra Pass, alt. 15,000 ped., J. D. H.

4. *Id.* var. fol. obtusiorib. [See also 293.]—Hab. Sikkim-Himalaya alpina; Donkia Pass, alt. 18,000 ped., J. D. H.

5. Var. *A. ambigua*, Wils. MSS. (two states; the smaller specimens with smaller areolæ).—Hab. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

6 (*b*). Acroschisma *densifolia*, W. MSS.—Hab. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

6 *a*. State of 2.—Hab. Sikkim-Himalaya alpina; Lachoong, alt. 14,000 ped., J. D. H.

6 *c*. State of *A. densifolia* (with *Jungerm.* near *juniperina*).—Hab. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

1. Andreæa *rigida*, W. MSS. (vix *A. Blyttii*, Bryol. Eur., var. *densifolia?*, non *A. crassinervia*, Bryol. Eur.)—Hab. Sikkim-Himalaya alpina; Tunkra Pass, alt. 15,000 ped., J. D. H.

1283. Sphagnum *cymbifolium*, Ehrh., var.—Hab. Mont. Khasia subtrop., alt. 3–4,000 ped., J. D. H. et T. T.

1287. *Id.*—Hab. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. H. D.

1289, 1292. *Id.* (normal state).—Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

1290. S. *cuspidatum*, Ehrh., var.—Hab. Sikkim-Himalaya temperata; Mainamchu, alt. 10,000 ped., J. D. H.

1291. *Id.* (smaller state.—Hab. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

1284. Var. alt.—HAB. Mont. Khasia subtrop., alt. 3–4,000 ped., J. D. H. et T. T.

1286. Var. alt.—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

1282. S. *contortum*, Schultz, var. fol. subrotundis.—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H.

1288. S. *fimbriatum*, Wilson.—HAB. Sikkim-Himalaya subalpina; Yeumtong, alt. 12,000 ped., J. D. H.

1285. *Id.*—HAB. Sikkim-Himalaya temperata; Fir-woods, Wallanchoon, alt. 10,000 ped., J. D. H.

1293. *Id.* var.—HAB. Mont. Khasia subtrop., alt. 3–4,000 ped., J. D. H. et T. T.

1288*. Var. fol. squarrosis.—HAB. Sikkim-Himalaya subalpina; Yeumtong, alt. 12,000 ped., J. D. H.

30. Phascum *tenue*, Wils. MSS.—HAB. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

157. Gymnostomum? *inflexum*, Wils. MSS. (barren).—HAB. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

121. Gymnostomum? *pellucens*, Wils. MSS. (allied to *G. curvirostrum*).—HAB. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

259. G. *involutum*, Hooker (*Pottia involuta*, C. Müller, i. 560).—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

194. *Id.*—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

177. *Id.* var.?—HAB. Sikkim-Himalaya temperata; Lachoong, alt. 6,000 ped., J. D. H.

260. *Id.?*—HAB. Ceylon, *Gardner*.

22. Mixture of this and of *G. rufescens*.—HAB. Simla-Himalaya temperata, T. T.

163, 264, 265, 266. G. *rufescens*, Hook.—HAB. Mont. Khasia subtrop. et temp., alt. 2–5,000 ped., J. D. H. et T. T.

262. Var.?—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 9,000 ped., J. D. H.

269. Var.? fol. crispulis.—HAB. Tibet occid. alpina; montibus prope Le, alt. 14–18,000 ped., T. T.

176. *Id.*—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

163. Var.?—HAB. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

128. G. *curvirostrum*, Hedw.—HAB. Tibet occid. temp.; Parkuta, Indus valley, alt. 8,000 ped., T. T.

130. *Id.* (♂ plt.)—HAB. Tibet occid. temp.; Tarkiti, Indus valley, alt. 8,000 ped., T. T.

133. Var. δ. *pallidisetum.*—HAB. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

129. Var. alt. (capsulis nitidis).—HAB. Tibet occid. temp.; Shayuk valley, alt. 9,000 ped., T. T.

130. *Id.*—HAB. Tibet occid. temp.; Tarkiti, Indus valley, alt. 8,000 ped., T. T.

131. Var. fol. breviorib. suberectis.—HAB. Tibet occid. temp.; Turtuk, Shayuk valley, alt. 9,500 ped., T. T.

547. Var.? approaching *G. calcareum* (barren).—HAB. Sikkim-Himalaya, J. D. H.

190. G. *xanthocarpum*, Hook.—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

132. Var.? barren.—HAB. Tibet occid. temp.; Shayuk valley, alt. 9,000 ped., T. T.

126 *b*, 127 *b*, 188. *Id.*—HAB. Tibet occid. temp.; Balti, alt. 6–7,000 ped., T. T.

271. Weissia *mucronata*, Bruch, var. (perist. null.)—HAB. Ceylon; Newera Ellia, alt. 6,000 ped., *Gardner*.

273. Two forms allied to 271, viz. (*Gymnostomum*). (*a*), fol. longiorib. erecto-patentib. (*Gymnostom.*) (*b*), fol. breviorib. patentib. distantibus, *capsula papillosa!* (*Gymnostom.*).—HAB. Ceylon, *Gardner*.

272. Weissia *controversa*.—HAB. Ceylon, *Gardner*.

145. *Id.*, var.—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 7,000 ped., J. D. H.

103, 104, 105, 146, 154. Weissia *serrulata*, var. *laxifolia* (*Grimmia laxifolia*, Hook. fil., Hook. Ic. Pl. t. 194 *B*. f. 1).—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 10–11,000 ped., J. D. H.

107. *Id.*—HAB. Nepal orient. trop.; Myong valley, alt. 4,000 ped., J. D. H.

43. W. *Indica*, Wils. MSS. (*W. crispulæ* affinis, capsula cylindrica). —HAB. Sikkim-Himalaya subalpina; Kambachen, alt. 12,000 ped., J. D. H.

118. *Id.*—HAB. Sikkim-Himalaya alpina; Tunkra Pass, alt. 15,000 ped., J. D. H.

28, 28 *b*. *Id.* barren?—Hab. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 14–17,000 ped., J. D. H.

100. *Id.* var.?—Hab. Nipal orient.; Islambo Pass, alt. 11,000 ped., J. D. H.

181. Syrrhopodon *fuscescens*, Wils. MSS. (between *Leprieurii* and *albovaginatus*).—Hab. Ceylon, *Gardner*.

135. S. *serrulatus*, Wils. MSS., allied to *Hobsoni*. I have the same species from Pernambuco, South America.—Hab. Ceylon.

187. Calymperes *Gardneri*, Hook.—Hab. Nipal orient. temp.; Tambur river, alt. 7,000 ped., J. D. H.

124. Syrrhopodon *cognatus*, Wils. MSS. (allied to 135, no marginal vitta, etc.)—Hab. Khasia temperata; Nurtiung, alt. 5,000 ped., J. D. H. et T. T.

235. Calymperes *linchophyllum*, Schwgr., var. — Hab. Ceylon, *Gardner*.

134. Holomitrium? *vel* Tortula?, *T. tortuosæ* affin. (barren).—Hab. Ceylon, *Gardner*.

195. Allied to 134, and also to 122 (barren).—Hab. Sikkim-Himalaya temperata; Chongtam, alt. 8,000 ped., J. D. H.

122. Symblepharis *densifolia*, Wils. MSS. (*Didymod. perichætiale*, Griffith, non Hook.)—Hab. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

123. Didymodon *squarrosum*, Hook. M. Exot.—Hab. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

102, 116. *Id.*—Hab. Sikkim-Himalaya alpina, alt. 8–12,000 ped., J. D. H.

111, 113, 113 *b*, 109 *c*, 125 *b*, 150. Symblepharis *Hookeri*, Wils. MSS. (*Didymodon vaginatus*, Hooker).—Hab. Sikkim-Himalaya alpina, alt. 9–12,000 ped., J. D. H.

108, 108 *b*, 109. *Id.* — Hab. Nipal orient. temp. et alp.; alt. 8–12,000 ped., J. D. H.

109 *b*. *Id.* — Hab. Sikkim-Himalaya temperata; Tonglo, alt. 7–8,000 ped., J. D. H.

125. *Id.*—Hab. Kumaon-Himalaya temp., alt. 6,000 ped., T. T.

112. *Id.* (with *Dicranum Wahlenbergii*).—Hab. Sikkim-Himalaya alpina; sandy soil, alt. 12,000 ped., J. D. H.

110. Symbl. *Hookeri*, var. capsul. elliptica, operc. oblique rostrato.—Hab. Sikkim-Himalaya temp.; Tonglo, alt. 7–8,000 ped., J. D. H.

110 *b*. Symblepharis *dilatata*, Wils. MSS. (leaves longer, wider at base, less crisped when dry).—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

136. *Id.?*—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

136 *b*. Symblepharis *breviseta*, Wils. MSS.—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

270. Rhabdoweissia *denticulata*, Bryol. Eur.—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

1280. Octoblepharum *albidum*, Hedw.—HAB. Sikkim-Himalaya tropica; Tchong-Pong, alt. 4–5,000 ped., J. D. H.

1281. *Id.*—HAB. Ceylon, *Gardner*.

1273. Leucobryum *brachyphyllum*, Hampe.—HAB. Nipal orient. trop.; Tambur river, J. D. H.

1270, 1271. Leucobryum *falcatum*, C. Müller (*Sphagnum Javense*, Schwgr. Suppl. t. 102).—Sikkim-Himalaya temperata; Ratong river, alt. 7,000 ped., J. D. H.

1278. *Id.*—HAB. Ceylon, *Gardner*.

1276. *Id.*—HAB. Mont. Khasia temperata; Nonkreem, alt. 5,000 ped., J. D. H. et T. T.

1279. Leucobryum *angustifolium*, Wils. MSS.—HAB. Ceylon, *Gardner*.

1272. *Id.* var.—HAB. Sikkim-Himalaya temperata; Ratong river, alt. 7,000 ped., J. D. H.

1275. *Id.*—HAB. Mont. Khasia subtrop.; alt. 4,000 ped., J. D. H. et T. T.

1269. Leucobryum *vulgare*, Hampe, var. ?—HAB. Sikkim-Himalaya temperata; alt. 5–8,000 ped., J. D. H.

1277. *Id.* var.—HAB. Mont. Khasia temperata; Myrung, alt. 5,000 ped., J. D. H. et T. T.

1274. *Id.*—HAB. Mont. Khasia subtrop.; Nunklow, J. D. H. et T. T.

643. Fissidens *grandifrons*, Brid. (♂ plt.)—HAB. Tibet occid. temp.; Drass, alt. 10,000 ped., T. T.

640. *Id.*—HAB. Chenab-Himalaya temperata; alt. 6,000 ped., T. T.

629, 632. *Id.*—HAB. Tibet occid. temp.; Indus valley, alt. 7–8,000 ped., T. T.

637. *Id.*—HAB. Himalaya bor.-occid. temp.; Simla, alt. 8,000 ped., T. T.

622. Fissidens *polypodioides*, Hedw. var. (*F. areolatus*, Griffith).—HAB. Khasia trop.; Churra, alt. 2–4,000 ped., J. D. H. et T. T.

620. *Id.* — HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

621, 625, 642. Fissidens *nobilis*, Griffith in Musci Assamici Itin.—HAB. Mont. Khasia temp. et subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

634, 635. *Id.*—HAB. Sikkim-Himalaya temperata, alt. 5–8,000 ped., J. D. H.

628. *Id.*—HAB. Ceylon; Rassowa, *Gardner*.

626. Fissidens *viridulus*, Linn.—HAB. Ceylon, *Gardner*.

638. Fissidens *incurvus*, Schwgr., var.—HAB. Sikkim-Himlaya temperata, alt. 7,000 ped., J. D. H.

623. Fissidens *jungermannioides*, Griffith (*rubricaulis*, Wils. MSS.)—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

624. Fissidens *cristatus*, Wils. MSS.—HAB. Mont. Khasia temperata; Nonkreem, alt. 5,000 ped., J. D. H. et T. T.

639. Fissidens *anomalus*, Montagne (*F. neckeroides*, Griffith).—HAB. Mont. Khasia temperata; Nunklow, alt. 4,000 ped., J. D. H. et T. T.

636. *Id.*—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 8,000 ped., J. D. H.

627. *Id.*—HAB. Ceylon, *Gardner*.

641, 619. Fissidens *involutus*, Wils. MSS.—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 10,000 ped., J. D. H.

631. Fissidens *discolor*, Wils. MSS.—HAB. Ceylon; Peradenia, *Gardner*.

633. Fissidens *debilis*, Wils. MSS.—HAB. Behar; moist banks, Soane river, J. D. H.

630. Fissidens *perpusillus*, Wils. MSS.—HAB. Ceylon; dry banks near Kandy, *Gardner*.

57, 60, and 61. Dicranum *scariosum*, Wils. MSS. (confer *D. convolutum*, C. Müller, Syn. M. i. 358).—HAB. Ceylon, *Gardner*.

71, 71 *b*., 88. Var. fol. longiorib., capsula breviore.—HAB. Sikkim-Himalaya temperata et alpina, alt. 11–14,000 ped., J. D. H.

65. Dicranum *relaxum*, Wils. MSS.—HAB. Mont. Khasia subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

70. Dicranum *Billardieri*, Schwgr., var.?—HAB. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

70 *b*. Var. alt.? nervo crassiori, fol. apice serrulatis.—HAB. Nipal orient. alpina; Wallanchoon, alt. 12,000 ped., J. D. H.

70 *c*. (vid. 70).—HAB. Sikkim-Himalaya alpina; Tunkra Pass, alt. 15,000 ped., J. D. H.

50 *b*. Dicranum *palustre*, Bryol. Eur.?, var. vel. sp. affinis (sterile). —HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

68. Dicranum *scoparium*, Linn., var.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 9,000 ped., J. D. H.

62. *Id.*—HAB. Himalaya bor.-occid.; Simla, T. T.

63. Var. alt.? (sterile).—HAB. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

50. Var. alt.? *elatum*, MSS.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 6,000 ped., J. D. H.

67 *b*. Dicranum *rugulosum*, Wils. MSS.—HAB. Sikkim-Himalaya temperata; Kambachen, alt. 11,000 ped., J. D. H.

67. Var. minus.—HAB. Nipal-Himalaya alpina; Kambachen, alt. 14,000 ped., J. D. H.

52. Dicranum *cristatum*, Wils. MSS.—HAB. Himalaya bor.-occid. temperata; Kashmir, alt. 6,000 ped., T. T.

54, 54 *b*. Dicranum *fragile*, Hook.—HAB. Mont. Khasia subtrop.; Nunklow, alt. 2–4000 ped., J. D. H. et T. T.

53. Dicranum *brevisetum*, Dz. et Molk. (C. Müll. i. 375).—HAB. Mont. Khasia temperata; Nonkreem, alt. 5,000 ped., J. D. H. et T. T.

56, 58, and 59. *Id.*—HAB. Ceylon, *Gardner*.

55. Dicranum *strumiferum*, Ehrh.—HAB. Tibet occid. temp., alt. 10–12,000 ped., T. T.

28. *Id.*—HAB. Sikkim-Himalaya alpina; Kinchin Jhow, alt. 16–17,000 ped., J. D. H.

106. Dicranum *polycarpum*, Ehrh.—HAB. Sikkim-Himalaya alpina, alt. 13,000 ped., J. D. H.

94 *b*. Mixture of several, viz.:—Dicranum *crispum*, var.?, Trichostomum *tortile*, Bryum near *polymorphum* (but dioic.), Dicranum *heteromallum?*. None in good condition.—HAB. Sikkim-Himalaya temperata, alt. 5,000 ped., J. D. H.

151, 151 *b*, 111 *b*, 112 *b*. Angstrœmia *Wahlenbergii*, C. Müll. Syn. M. ii. 610, var. *Dic. virens*, *β*, Bryol. Eur.—HAB. Sikkim-Himalaya temperata et alpina, alt. 7–13,000 ped., J. D. H.

98. Dicranum *patulum*, Wils. MSS. (*D. squarroso* aff.).—HAB. Himalaya bor.-occid. temp.; Simla, 8,000 ped., T. T.

94. *Id.*—HAB. Sikkim-Himalaya temperata; Lachen-Lachoong, alt. 5,000 ped., J. D. H.

40. Angstrœmia *exigua*, C. Müller, i. 444.—HAB. Sikkim-Himalaya temperata; clay banks, Darjeeling, alt. 7,000 ped., J. D. H.

263. Dicranum *Blyttii*, Bryol. Eur., var.?—HAB. Sikkim-Himalaya temperata, alt. 10,000 ped., J. D. H.

83. Dicranum *cerviculatum*, Hedw.—HAB. Mont. Khasia subtrop.; Churra, alt. 2–4,000 ped., J. D. H. et T. T.

10, 15, 15 *b*, 16, 12. Dicranum *heteromallum*, Hedw.—HAB. Sikkim-Himalaya temperata, alt. 7–13,000 ped., J. D. H.

14. *Id.*—HAB. Nipal orient. temp.; Phulloot, alt. 8,000 ped., J. D. H.

13. Var.—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

87 *b*. Var.—HAB. Mont. Khasia subtrop.; Nunklow, alt. 2–4,000 ped., J. D. H. et T. T.

95. Campylopus *tenuis*, Wils. MSS. (allied to *Dic. nanum*, C. Müll. i. 383).—HAB. Sikkim-Himalaya temperata; clay banks, Darjeeling, alt. 7,000 ped., J. D. H.

97. Var.?—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

51, 51 *b*. Dicranum *uncinatum*, C. Müll. i. 404 (*Thysanomitrium*, Harvey).—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 7–11,000 ped., J. D. H.

27. *Id.* (with *Dicranum*, see 65); also *Weissia serrulata* intermixed.—HAB. Nipal orient. temp.; Wallanchoon, alt. 10–12,000 ped., J. D. H.

27 *b*. *Id.* 51.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 8,000 ped., J. D. H.

19. *Id.* 51 (with *Dicranodontium*, see 29). (♂ plt.)—HAB. Nipal orient. temp.; Wallanchoon, alt. 10–12,000 ped., J. D. H.

29. Dicranodontium *asperulum*, Wils. MSS. (allied to *D. longirostre*, Bryol. Eur.).—HAB. Nipal orient. temp.; Yalloong mountains, alt. 10,000 ped., J. D. H. (With *Campylopus*, allied to 89 *b*, intermixed, barren.)

11, 11 *b*, 18, 81 *b*. *Id.* 29.—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 8–9,000 ped., J. D. H.

77 *b*, 72 *b*, 73 *b*. *Id.*—HAB. Mont. Khasia temperata, alt. 4,000 ped., J. D. H. et T. T.

64. Var. *elatum* (sterile).—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

78 *b*. Dicranodontium *attenuatum*, Wils. MSS.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

72. Dicranum? *sericeum*, Wils. MSS.—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

69. *Id.* (sterile).—HAB. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

74. Campylopus *nivalis*, Brid.—HAB. Ceylon, *Gardner*.

80. Var.? minor.—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

90. Var.? (sterilis).—HAB. Ceylon, *Gardner*.

90 *b*. *Id.*—HAB. Nilgiri mountains, *G. Thomson*.

87 *c*. *Id.?*—Himalaya occid. temp.; Kumaon, alt. 6,000 ped., T. T.

66 *d*. *Id.*—HAB. Sikkim-Himalaya alpina, alt. 12,000 ped., J. D. H.

87 *d*. *Id.?*—HAB. Nipal orient. temp., alt. 9,000 ped., J. D. H.

26. Var. alt.? vel. sp. affiniss. (sterile).—HAB. Nipal-Himalaya temperata; Phulloot, alt. 8,000 ped., J. D. H.

23, 66 *c*. fol. longiorib., closely allied to 26 (with *C. crassinervis*, W. MSS.).—HAB. Sikkim-Himalaya temperata et alpina; Lachen, alt. 9–12,000 ped., J. D. H.

79. Campylopus *compactus*, Wils. MSS.—Nipal orient. trop.; Khabili river, J. D. H.

79 *b*. *Id.*—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

86. *Id.* var.—HAB. Mont. Khasia subtrop.; Churra, alt. 2–4,000 ped., J. D. H. et T. T.

89. Dicranum (Campylopus) *reduncum*, Hsch. et Reinw.? (C. Müll. i. 396), with a *Dicranum* (barren), *D. lubricum*, Wils. MSS.—HAB. Ceylon, *Gardner*.

87. Dicranum *lubricum*, Wils. MSS.—HAB. Nipal-Himalaya temperata; Kambachen, alt. 11,000 ped., J. D. H.

31. Dicranum *sordidum*, Wils. MSS. (closely allied to 87).—HAB. Sikkim-Himalaya temperata; Ratong river, alt. 7,000 ped., J. D. H.

66. Campylopus *crassinervis*, Wils. MSS.—HAB. Sikkim-Himalaya alpina; Tunkra Pass, alt. 14,000 ped., J. D. H.

66 *b* et *c*. *Id.*—HAB. Sikkim-Himalaya alpina; Kongra-Lama, alt. 14,000 ped., J. D. H.

76 *c*. Campylopus *flexuosus*, Linn., var.?—Hab. Ceylon, *Gardner*.

73. Var. alt.?—Hab. Mont. Nilgiri, *G. Thomson*.

77. Dicranum *Dozianum*, C. Müller, Syn. M. i. 385 (*Campylopus*).—Hab. Mont. Khasia temperata, alt. 5,000 ped., J. D. H. et T. T.

78. *Id*.—Hab. Sikkim-Himalaya temp., alt. 5,000 ped., J. D. H.

76 *b*. *Id*.—Hab. Ceylon, *Gardner*.

84, 92. Var.—Hab. Mont. Khasia temp. et subtrop., alt. 3–5,000 ped., J. D. H. et T. T.

96. *Id*.—Hab. Sikkim-Himalaya temperata; Chongtam, alt. 6,000 ped., J. D. H.

93. Var.—Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

82. *Id*.—Hab. Behar ad Mont. Paras-Nath subtrop., alt. 4,000 ped., J. D. H.

91. *Id*.—Hab. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H.

76. Dicranum *Dozianum*, C. Müll. (fine specimen, in fr.?).—Hab. Ceylon, *Gardner*.

85. *Id*. (♂ plant).—Hab. Ceylon, *Gardner*.

17. Campylopus *canescens*, Wils. MSS.—Hab. Mont. Nilgiri, *Gardner*.

81. Campylopus (*Dicranum clavatum*, R. Br.).—Hab. Sikkim-Himalaya temperata; Changachilling, alt. 5–7,000 ped., J. D. H.

75. Var.?—Hab. Ceylon, *Gardner*.

273. Desmatodon *Laureri*, Bryol. Eur., var. foliis latioribus, with another variety or species (fol. obtusis, concavis, chlorophyllosis).—Hab. Tibet occid. alp.; valley south-east of salt lake, alt. 16,000 ped., T. T.

186. Desmatodon *cernuus*, Bryol. Eur.—Hab. Tibet occid. alp.; Parang valley, alt. 15,000 ped., T. T.

117, 119. Desmatodon *latifolius*, Bryol. Eur., var.—Hab. Sikkim-Himalaya alpina et temperata, alt. 7–14,000 ped., J. D. H.

20, 34, 147, 148. Distichium *capillaceum*, Bryol. Eur.—Hab. Sikkim-Himalaya temperata; Lachen, alt. 5–11,000 ped., J. D. H.

32. *Id*.—Hab. Tibet occid. alp.; valley south-east of salt lake, alt. 16,000 ped., T. T.

38, 39. *Id*.—Hab. Sikkim-Himalaya alp.; Lachoong, alt. 15–18,000 ped., J. D. H.

37. *Id.*—Hab. Tibet occid. temp.; Iskardo, alt. 7,500 ped., T. T.

33. *Id.*—Hab. Mountains above Le, alt. 12–18,000 ped., T. T.

36, 99 *b*. *Id.* (et var. fol. breviorib.).—Hab. Tibet occid. temp.; Nubra mountains, alt. 11,000 ped., T. T.

35. *Id.* (two forms).—Hab. Tibet occid. alp.; Sassar Pass, Nubra, alt. 16–17,000 ped., T. T.

99. *Id.* (two forms as in 36).

274. *Id.*—Hab. Tibet occid. alp.; top of Hera La, alt. 18,700 ped., *H. Strachey.*

275. *Id.* (small state).—Hab. Tibet occid. alp., alt. 12–18,000 ped., T. T.

261. Distichium *inclinatum*, Bryol. Eur.—Hab. Sikkim-Himalaya alpina; Kinchin Jhow, alt. 17,000 ped., J. D. H.

144, 120, 182. Didymodon *rubellus*, Bryol. Eur.—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

152. Var. capsula breviori, operc. longiori.—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

115, 149. Didymodon *cylindricus*, Bryol. Eur.—Hab. Sikkim-Himalaya temperata; alt. 7–11,000 ped., J. D. H.

159. Var.? fol. elongatis, fragilibus. See 164 *b*. for *Trichostomum Bombayense*, C. Müll. ii. 628.—Hab. Nipal orient. alp.; Kambachen, alt. 14,000 ped., J. D. H.

161, 179. Didymodon *duriusculus*, Wils. MSS.—Hab. Ceylon, *Gardner.*

137. Trichostomum *dentatum*, Wils. MSS. (*Didym. flexifolio* affin.) —Hab. Tibet occid. temp.; Shayuk valley, alt. 9,000 ped., T. T.

114, 167. *Id.*—Hab. Sikkim-Himalaya temperata et alpina, alt. 10–13,000 ped., J. D. H.

267. *Id.*—Hab. Sikkim-Himalaya temperata, alt. 5,000 ped., J. D. H.

191. Ceratodon *stenocarpus*, Br. et Sch.—Hab. Sikkim-Himalaya temperata, alt. 6,000 ped., J. D. H.

155. *Id.? vel* Ceratodon *purpureus*, Brid. (sterile).—Hab. Tibet occid. temp.; Balti, Iskardo, alt. 7,000 ped., T. T.

46, 48. Trematodon *longicollis*, Rich.—Hab. Sikkim-Himalaya temperata, alt. 5–8000 ped., J. D. H.

47, 49. Var.—Hab. Sikkim-Himalaya temperata, alt. 4–7,000 ped., J. D. H.

45. Var.—Hab. Ceylon; Matale, *Gardner.*

512. Var.?—Hab. Ceylon; Matale, *Gardner.*

(*To be continued.*)

Descriptions of Four New Tasmanian Plants; *by* Dr. Ferdinand Mueller, Colonial Botanist, Melbourne, Victoria.

1. Geum (Sieversia) *renifolium*, Ferd. Muell.; rhizomate estolonoso, caule simplice unifloro pube brevi articulato glanduligero et simplice vestito, stipulis latis antice dentatis ciliatis, foliis hirsutis radicalibus pinnatisectis, segmentis lateralibus 1–3-jugis minutis v. nullis, terminali maximo reniformi crenato et brevissime lobato, foliis caulinis parvis dissitis ambitu cordato- v. orbiculari-ovatis inciso-dentatis, bracteolis oblongo-lanceolatis subemarginatis calycem dimidium æquantibus, calycis extus hirsuti laciniis late ovatis subacuminatis, petalis . . ., aristis semiexsertis pilosis prope apicem revolutum nudis inarticulatis.

Hab. In monte La Perouse Tasmaniæ, *Stuart!*

Rhizoma crassum, cortice badio obductum. *Stipulæ* amplæ, fuscæ vel spadiceæ, collum radicis terminantes. *Petioli* foliorum radicalium cum rachi longitudinem lobi terminalis æquantes v. duplo excedentes, velutino-pubescentes. *Lobus* folii terminalis 1½–2½″ latus, radiato-nervosus, pulchre reticulato-venosus. *Caules* supra medium foliis tribus acute dentatis, ½–1″ longis, sessilibus, amplexantibus obsessi. *Calyx* circiter semunciam longus. *Petala* fugacia desunt. *Stamina* numerosa, calyce dimidio breviora, filamentis dilute flavis, lineari-subulatis. *Antheræ* subrotundæ, fulvescentes, deciduæ. *Styli* semunciales, pilis paulo flavescentibus induti, apice saturate rubri. *Carpidia* numerosa, pubescentia.—(Anth. Mart.)

2. Senecio *primulifolius*, Ferd. Muell.; herbaceus, perennis, caule simplice adscendente v. erecto basi dense sericeo-tomentoso, *foliis radicalibus* confertis *cordato-ovatis* repandis petiolatis obtusis subtus v. utrinque araneosis, *folio caulino solitario* amplexante oblongo v. panduriformi argute dentato, pedunculis terminalibus geminis ternisve bractea foliacea suffultis araneoso-lanuginosis, involucri late campanulati foliolis 16–18 lanceolato-linearibus parce araneosis bracteas laxiusculas subduplo superantibus apice barbatis discum æquantibus,

ligulis pluribus conspicuis, acheniis glabris pappo fere triplo brevioribus.

HAB. In monte La Perouse Tasmaniæ austro-occidentalis alpinæ detexit *Stuart*.

Herba spithamæa–sesquipedalis, radice fibrillas emittente. *Folia* petiolo æquilongo v. aliquoties breviore prædita, utplur. $1\frac{1}{2}$–$2\frac{1}{2}''$ longa, obtusa, margine vix recurva. *Caulis* angulatus, ætate glabrescens. *Pedunculi* capitulo paulo vel multo longiores. *Involucrum* semipollicem longum. *Ligulæ* semunciam paulo excedentes. *Corollæ* disci sensim ampliatæ pappum æquantes, *styli* ramis exertis. *Achenia* nondum matura, jam $1'''$ longa. *Pappus* albus.—(Anth. Febr., Mart.)

3. Senecio *papillosus*, Ferd. Muell.; herbaceus, perennis, caule simplicissimo monocephalo basi dense piloso cetero pube crispa induto, *foliis radicalibus* confertis parvis *spathulato-obovatis* sensim in petiolum desinentibus integerrimis margine parum recurvis *supra papilloso-asperis* subtus parce piligeris, foliis caulinis angusto- v. lineari-lanceolatis sessilibus vix dentatis, involucri fere hemisphærici foliolis 20–22 lanceolato-linearibus apice subsphacelatis barbato-ciliatis dorso parce papillosis et pilosis bracteas appressas parum v. dimidio superantibus disco æquilongis, ligulis conspicuis pluribus, acheniis glabris pappum dimidium æquantibus.

HAB. In monte La Perouse Tasmaniæ, *Stuart*.

Herba utplurimum spithamæa, radice fibrilligera. *Folia* uncialia v. breviora, *radicalia* petiolo æquilongo v. breviore piloso prædita, crassiuscula, obtusa; *caulina* satis distantia. *Capitula* semipollice vix longiora. *Ligulæ* semunciales vel breviores, obtusæ. *Corollæ* disci basi valde attenuatæ, apice sensim ampliatæ, pappo albo æquilongæ. *Achenium* nonnisi immaturum visum, vix $1'''$ excedens.—(Anth. Febr., Mart.)

4. Trineuron *scapigerum*, Ferd. Muell.; erectum, *caule scapiformi* puberulo, foliis lanceolato- v. spathulato-linearibus acutis radicalibus confertis in petiolum basi fimbriatum sensim angustatis caulino solitario floralibusque sessilibus, nervis lateralibus indistinctis, capitulis paucis terminalibus dense v. corymboso-confertis foliaceo-bracteatis, involucri squamis 8–12 oblongis pellucide trinerviis vix coriaceis, floribus omnibus quadridentatis, stylo florum fœmineorum breviter bifido masculorum vix diviso, acheniis . . .

HAB. In monte La Perouse Tasmaniæ austro-occidentalis, *Stuart*.

Herba sesqui-tripollicaris, rhizomate perenni, fibras copiosas producente. *Folia* radicalia sæpe pollicaria, 1½–2‴ lata, margine recurva, subcoriacea, floralia paucas lineas longa. *Involucri* squamæ circiter 1½‴ longæ, interiores exterioribus paulo angustiores. *Achenium* immaturum oblongum, basi attenuatum.—(Anth. Mart.)

A speciebus ceteris (*T. spathulato*, *pusillo* et *nivigeno*) inter se valde similibus habitu longe diversum.

On some New Genera of AUSTRALIAN PLANTS, *discovered during the progress of the* North Australian Exploring Expedition; *by* DR. F. MUELLER, Botanist to the Expedition, and Colonial Botanist at Victoria.

NAT. ORD. BUETTNERIACEÆ.

Gen. I. DICARPIDIUM, *F. Muell.*

Flores monoici. *Involucellum* bi–triphyllum, unilaterale. *Calyx* 5-fidus, ovato-campanulatus, æstivatione valvatus. *Petala* 5, æstivatione convolutiva, libera, calycem excedentia, oblongo-cuneata. MASC. *Filamenta* 5, inferne in tubulum connata. *Antheræ* supra basin affixæ, ovatæ; loculis parallelis longitudinaliter dehiscentibus. *Styli* 2, filiformes, reflexi. *Stigmata* indistincta. FŒM. *Stamina* 5. *Filamenta* omnino in tubum connata. *Antheræ* steriles, seorsæ, lato-ovatæ, longitudinaliter extrorsum dehiscentes, supra basin extus cylindro filamentorum affixæ. *Germina* 2, subovata. *Styli* 2, liberi, inferne villosuli, filiformes, erecti. *Stigmata* tenui-clavata. *Carpidia* duo, dimidiato-ovata, acuminata, ad commissuram longitudinaliter et secus dorsi apicem dehiscentia monosperma. *Semina* ovata, dorso convexa, ventre planiuscula. *Embryo* in axi albuminis carnosi rectus. *Cotyledones* planæ. *Radicula* infera.—Fruticulus Australiæ borealis *hirsutus*; foliis *alternis vel fasciculatis*, *oblongis*, *margine subserratis*, *stipulis lineari-subulatis*; floribus *axillaribus et terminalibus*, *solitariis geminis ternisve*, *breviter pedicellatis*; petalis *purpureis*.—Genus *Waltheriæ* cognatum.

Dicarpidium *monoicum*.

HAB. In locis arenoso-rupestribus ad originem fluviorum M'Arthur's River et Seven Emu Creek, sinus Carpentariæ.—(Anth. Jun.–Aug.)

Fruticulus ½–2′, diffusus, rarius erectus, patentim ramosus, pilis stellaribus undique hirsutus. *Rami* teretes. *Folia* alterna vel frequentius ramulis inexplicatis 2–4 fasciculato-conferta, utplurimum ½–1½″ longa, 3–5‴ lata, lanceolato- vel cuneato-oblonga, nervis supra impressis rugosa, subtus pallidiora, margine serrata vel crenato-crispata, petiolo 1½–3‴ longo donata. *Stipulæ* obscure fuscæ, lineari-subulatæ, ad 3‴ longæ. *Involucri* foliola lineari-subulata, 2–2½‴ longa, intermedium lateralibus duplo brevius, nunc omnino incompleta. *Calyx* subsessilis, circiter 3‴ longus, laciniis lanceolatis acuminatis tubo vix æquilongis, extus hirsuto-tomentosus, intus præter apicem glaber. *Petala* fere semuncialia, glabra, longe in basin angustata, prope medium sæpe aurantiaca, inferne lutea. Masc. *Filamenta* 2½‴ longa, antheris quam floris fœminei paulo majoribus. Fœm. *Tubulus filamentorum* sesquilineam longus, lividus. *Antheræ* vix ½‴ longæ. *Germina* sessilia, albo-sericea. *Styli* 1½‴ longi. *Stigmata* vix 1‴ metientia. *Carpidia* extus pubescentia, vix 2‴ longa, in fructum lato-ovatum leniter compressum conniventia. *Semina* 1‴ paulo longiora, nigrescentia, parum rugulosa.

Nat. Ord. MELIACEÆ.

Gen. I. Owenia, *F. Muell.*

Sepala 5, imbricata, subrotunda. *Petala* 5, oblonga, æstivatione imbricata. *Columna filamentorum* petalis paulo brevior, campanulata, irregulariter acute dentata. *Antheræ* 10, dentibus columnæ intus insertæ, lineares, biloculares, loculis longitudinaliter dehiscentibus. *Stylus* brevissimus. *Stigma* late conicum, obtusum, basi annulo cinctum. *Germen* glabrum, hemisphæricum, acuminatum. *Drupa* globosa. *Pericarpium* carnosum vel exsuccum. *Putamen* crassum, durissimum, rimoso-rugosum, 1–3- rarius pluri-loculare, loculis monospermis. *Semina* exarillata. *Testa* subcoriacea. *Albumen* nullum. *Cotyledones* crassæ, oleosæ. *Radicula* brevis v. brevissima, supera.—Arbores Australiæ tropicæ, *vix in regiones subtropicas migrantes, innovationibus sæpe viscosis;* foliis *simpliciter pinnatis;* spicis *axillaribus, pedunculatis;* floribus *parvis, viridulis;* drupis *majusculis, sæpe acerbis.*—Genus *Nemedræ* forsan cognatum ceteroquin inter *Trichilieas* fructu drupaceo prorsus alienum, illustrissimo *Richardo Owen*, anatomo præstanti, totius regni animalium scrutatori inclyto, dignissimo pia mente tributum.

1. Owenia *acidula;* glabra innovationibus vernicosis, foliis 7–15-jugis, rachi semitereti canaliculata arcuata, foliolis angusto-lanceolatis in apicem longe acutatis sessilibus uninerviis subaveniis, drupis globosis, pericarpio carnoso, putamine leviter rugoso sphærico triloculato excavationibus destituto, seminibus turgide ovatis, radicula brevissima.

HAB. In planitiebus montibusque a flumine Burdekin usque ad partes superiores fluvii Brisbane.*—(Anth. Oct.–Dec.)

Arbor minor, nunc mediocris, cortice rugoso et satis profunde rimoso nigricante prædita. *Folia* modice petiolata. *Rachis* addito petiolo 4–8″ longa, foliolo diminuto ad 3‴ longo, lineari-subulato, terminata. *Foliola* 1–1½″ longa, 3–5‴ lata, in basin brevius in apicem longius acutata, plana, integerrima, inferiora sæpe alterna superiora opposita. *Spicæ* axillares, solitariæ, pluri–multifloræ, pedunculo ½–1″ longo suffultæ, 1–2″ longæ, non raro interruptæ. *Pedicelli* brevissimi vel nulli. *Flores* solitarii gemini vel ternati. *Calyx* basi bracteolis tribus oblongis suffultus; *bracteola* media vix 1‴ longa, laterales duplo breviores. *Sepala* sub florescentia etiam imbricata, subrotunda, ciliolata, lineam vix excedentia. *Petala* 5, oblonga, tenui-membranacea, glabra, decidua, sessilia, circiter 2‴ longa. *Columna* extus glabra, inferne albida, superne virens, intus subtilissime puberula. *Antheræ* acutiusculæ, flavæ, ¾‴ longæ. *Stylus* brevissimus, viridis, glaber. *Stigma* aurantiacum, ½‴ longum, annulo parum prominulo. *Drupa* diametro 1–1½″, pericarpio extus dilute et squalide erubescente pallide subreticulata, intus lætius et saturatius rubro, primum acerbo mox jucunde acidulo. *Semina* sapore nauseosa.†

2. Owenia *venosa;* glabra, innovationibus vix vernicosis, foliis 3–4-jugis, rachi semitereti cum teretiusculo petiolo recto, foliolis ovato- vel lanceolato-oblongis obliquis apice obtusis vel emarginatis brevissime petiolulatis uninerviis venosis, drupis globosis, pericarpio carnoso, putamine læviusculo sphærico excavationibus destituto triloculato, seminibus turgide ovatis, radicula brevissima.

HAB. Ad ripas rivulorum exsiccantium tractus montani inter flumina Dawson et Burnett.‡

* Originally found in the Arbuthnot range by Mr. Fraser.—ED.

† Fructus hujus et congenerum struthionibus Novæ-Hollandiæ gratus.

‡ We have a specimen of this species, sent by Mr. C. Moore as the plant from which the wood No. 57 of the Sydney woods in the Paris Exhibition was procured. —ED.

Frutex altior, arborescens. *Folia* petiolo 2–3″ longo prædita. *Rachis* petiolo æquilonga vel dimidio longior, apiculo minuto secedente terminatus. *Foliola* coriacea, 1–2″ longa, 5–10‴ lata, plana, integerrima, supra saturate viridia, nitidula, subtus pallidiora, inæquilatera, in petiolulum angustata, inferiora sæpe alterna, superiora opposita. *Drupa* pollicaris vel paulo major, squalide rubra, subfurfuracea. *Pericarpium* intus dilute rubrum, sapore nauseoso. *Semina* 3 vel abortu 1–2.

Formis intermediis forsan cum *O. venosa* confluit.

3. Owenia *reticulata;* innovationibus vix viscidulis, foliis magnis 4–5-jugis, rachi semitereti rectiuscula, foliolis ovatis oppositis sessilibus subobliquis apice basique obtusis uninerviis integerrimis supra glabriusculis subtus densissime reticulato-venosis cum rachi puberulis, drupis globosis, pericarpio carnoso, putamine rugoso triloculato.

Hab. Ad sinum Gulf of Carpentaria.

Arbor minor v. mediocris. *Folia* sæpe ultra pedem longa. *Rachis* superne marginata. *Foliola* 3–5″ longa, sæpe 2″ lata, nervo medio utrinque prominente, supra pennivenia nitidula, subtus opaca, inferiora minora. *Drupæ* fusco-rubræ, sesquiunciales, structura *O. acidulæ*.

4. Owenia *cerasifera;* foliis 3–5-jugis, rachi teretiuscula subrecta pubescente, foliolis oppositis oblique ovatis vel oblongo-ovatis brevissime petiolulatis obtusis penninerviis venosis supra glabriusculis subtus vel utrinque tenuiter pubescentibus, drupis depresso-globosis, pericarpio carnoso, putamine irregulariter sulcato rugoso depresso-globoso intus excavationibus massa medullari repletis prædito pluriloculato, seminibus curvato-oblongis compressis, radicula brevi.

Hab. Ad ripam collinam fluvii Burdekin.

Arbor minor, cortice rugoso et rimuloso nigrescente. *Ramuli* apice pubescentes, nec vernicosi. *Folia* longiuscule petiolata. *Rachis* addito petiolo 4–6″ longa. *Foliola* $1\frac{1}{2}$–3″ longa, 1–$1\frac{1}{2}$″ lata, plana, integerrima, nervis præsertim subtus prominulis venisque percursa, in nervorum axi calloso-incrassata, basi et apice obtusa, interdum ad jugum unicum cum impari reducta. *Drupa* diametro 1–$1\frac{1}{2}$″, cerasi nigræ colore, lævis, nitens. *Pericarpium* intus læte rubrum, acerbum, denique jucunde acidum. *Putamen* pluri- (12-) loculare. *Sapor* seminum gratus.

Nat. Ord. SAPINDACEÆ.

Gen. I. Distichostemon, *F. Muell.*

Flores dioici. *Sepala* 6–8. *Petala* nulla. Masc. *Stamina* 20–32, dicycla. *Filamenta* brevissima. *Antheræ* basifixæ, lineari-tetragonæ, biloculares, longitudinaliter dehiscentes. *Discus* nullus. *Stylus* abortivus. Fœm. *Discus* hypogynus convexus, indivisus. *Stamina* rudimentoria, minutissima. *Stylus* centralis, filiformis, indivisus. *Stigma* simplex. *Germen* triloculare, loculis bigemmulatis. *Gemmulæ* anguli centralis medio superposite affixæ, superior adscendens, inferior pendula. *Capsula* chartacea, trilocularis, septicide trivalvis, valvis navicularibus herbaceo-alatis. *Columna* dissepimentis alata, persistens. *Semina* in loculis gemina, vel abortu solitaria.—Frutex *pubescens* Australiæ torridæ; foliis *alternis, subovatis, repandis, rugulosis, herbaceis;* floribus *racemosis.*—Genus ob staminum constantim pluralitatem satis a *Dodonæa* aliisque ordinis distinctum, proprio habitu gaudens.

1. Distichostemon *phyllopterus.*

Hab. A fluvio Victoriæ ad rivum Burdekin in solo steriliore non rarus, sicut in Australia centrali.—(Anth. perpetua.)

Frutex pauci–pluripedalis, ramis patentibus, ramulis teretiusculis. *Folia* oblongo- vel elliptico-obovata, breviter petiolata, margine obscure crenulato-repanda, dense ciliolata, 1–2″ longa, 6–9‴ lata, pennivenia. *Racemi* masculi terminales, sæpius paniculati, utplurimum pauciflori. *Pedicelli* 2–3‴ longi, bracteolam linearem basalem superantes. *Sepala* lanceolata, maris lineam parum excedentia, fœminæ duplo majora. *Antheræ* puberulæ, basi emarginatæ, apice apiculatæ, florescentes. *Discus* puberulus. *Stylus* atro-purpureus, 7–9‴ longus, leviter contortus, deciduus. *Capsula* 3- raro 4-locularis, valvis 3 rarius 4, obtusis, 4–5‴ longis, extus tenuissime pubescentibus, a medio ad apicem dorsi alatis. *Alæ* 2–3‴ longæ, superne 1–1½‴ latæ, obtusæ, foliaceæ. *Funiculi* breves.

Gen. II. Apophyllum, *F. Muell.*

Flores polygamo-dioici. *Sepala* 3–4, oblonga vel ovata, æstivatione imbricata. *Petala* 3–4, rarius 2, libera, sepalis alterna, basin versus barbata, æstivatione imbricata. Masc. *Stamina* 10–16, libera. *Filamenta* inclinata, inferne barbata, vertici disci carnosi inserta. *Antheræ* loculi longitudinaliter dehiscentes. *Styli* et germinis rudi-

menta nulla. HERMAPHR.-FŒM. *Stamina* nulla vel 1–3, cum stipite germinis disco integerrimo depresso-hemisphærico inserta, a pistillo divergentia. *Filamenta* sigmoidea, libera. *Stipes* germinis declinatus. *Germen* glabrum, oblique ovato-globosum. *Stigma* sessile, concavum. *Fructus* exsuccus, subglobosus, evalvis, 1–2-spermus. *Semina* nephroidea. *Testa* crustacea. *Endopleura* membranacea. *Albumen* nullum. *Cotyledones* circinato-involutæ. *Radicula* extraria.—Frutex Australiæ orientalis *intratropicæ et subtropicæ* Hakeæ *facie, parce sericeus, glabrescens, cito defoliatus;* foliis *simplicibus, in ramulis alternis, dissitis, linearibus;* stipulis *perminutis;* floribus *parvis, solitariis vel racemosis.*—Genus inter *Sapindaceas Dodonæaceas* abnorme.

1. Apophyllum *anomalum.*

HAB. In virgultis eremi (Brigalow Scrub) a parte inferiore fluminis Burdekin usque ad rivum Dawson.—(Anth. Oct., Nov.)

Frutex altior, interdum arborescens, ramis cernuis, ramulis sæpe pendulis. *Rami* teretes, glabrati, aphylli; *ramuli* leviter compressi, nonnunquam fasciculati, pube brevissima subsericea canescentes, cum foliis glabrescentes. *Folia* crassiuscula, caduca, in ramulis alterna, satis dissita, in petiolum lineam longum et breviorem desinentia, obtusiuscula, indistincte canaliculata, $\frac{1}{3}$–1″ longa, 1‴ lata, enervia, avenia, in ramulis florentibus bracteæformia 1–2‴ longa oblongata. *Stipulæ* fuscæ, glabræ, subulatæ, sæpe obliteratæ caducissimæ. *Flores* fragrantes, infra apicem ramulorum juvenilium subracemosi vel racemos laterales formantes. *Pedicelli* in axi folii caduci bracteæformis solitarii, rarius gemini, subanthesi 1–1$\frac{1}{2}$‴ longi, ebracteolati. *Sepala* concava, obtusa, cano-subsericea, lineam paulo excedentia, enervia, decidua. *Petala* calyci æquilonga, vel dimidio longiora, flava, viridia, ovata, nunc subrotunda, apice fere truncata, sæpe erosa raro acuta, extus glabra, intus præsertim basin versus barbata. *Antheræ* flavæ, quadrato-ovatæ, biloculares, paulo supra basin affixæ, glabræ, introrsæ, $\frac{1}{3}$‴ longæ. *Filamenta* flavo-virentia, 1‴ metientia, inferne barbata. *Stipes* germinis glaber, ruber, declinatus, 1‴ longus. *Germen* sordide viride, læve. *Pedicelli* fructiferi 3‴ longi. *Stipes* incurvus, nunc 1$\frac{1}{2}$‴ metiens. *Fructus* subglobosus, leniter compressus, viridis, 3–4‴ longus, lævis, glaber. *Semina* circiter 2‴ metientia, globoso- vel ovato-reniformia, lævia, fulva v. fusca, leniter compressa.

Nat. Ord. MELIACEÆ.

Gen. I. Strzeleckya, *F. Muell.*

Sepala 5, suborbicularia. *Petala* 5, æstivatione imbricata. *Stamina* 10 vel pauciora; 5 fertilia, sepalis opposita; filamentis subulatis; antheris cordatis, bilocularibus, introrsis, supra basin affixis, loculis longitudinaliter dehiscentibus. *Filamenta* 5 vel pauciora, sterilia, ananthera, petalis opposita, brevissima, interdum nulla, omnia infra discum hypogynum inserta. *Stylus* brevissimus. *Stigma* peltato-hemisphæricum. *Germen* globosum, apice 5-glandulosum. *Capsula* subcoriacea?, ellipsoidea, echinato-tuberculata, 5-valvis, 5-loculata; valvis cymbiformibus ab axi 5-lamellato solutis, laminis crasso-coriaceis septiformibus utrinque dispermis. *Semina* compressa, undique alata, superposita, umbilico laterali. *Embryo* . . .—Arbuscula Novæ-Hollandiæ orientalis *intratropicæ et subtropicæ;* foliis *parvis, oppositis, impari-pinnatis,* 1–2-*jugis, glabris, rachi foliaceo-alata;* foliolis *oblongis, basi angustatis, oppositis, sessilibus, integerrimis;* paniculis *terminalibus, opposite ramosis;* floribus *parvis, albis;* capsulis *minoribus, graveolentibus.*—Genus inter *Flindersiam* et *Oxleyam* medium, limites inter hæcce genera satis artificiales ut videtur disrumpens, viro nobili Strzeleckyo, exploratori terrarum Australium fama Flindersii et Oxleyi dignissimo, pia mente dicatum.

1. Strzeleckya *dissosperma.*

Hab. In virgultis præsertim *Eremophilæ Mitchelli* a flumine Burdekin ad fluvium Burnett.—(Anth. Sept.–Dec., nisi perpetua.)

Frutex altior vel *arbuscula.* *Foliola* coriacea, oblongo-linearia vel oblonga, obtusa, sensim in basin angustata, margine vix recurva, supra nitentia, lævia, subtus pallidiora, opaca, lateralia $\frac{3}{4}$–$1\frac{1}{2}''$ longa, terminale paulo longius. *Paniculæ* sæpius multifloræ. *Pedunculi* et *pedicelli* angulati, parce puberuli, hi floribus æquilongi. *Bracteolæ* ovato-lanceolatæ, vix $\frac{1}{2}'''$ longæ. *Sepala* viridula, ciliolata, $\frac{2}{3}'''$ longa, appressa. *Petala* $1\frac{1}{2}'''$ longa, glabra, ovata, integerrima, inferne rubella. *Discus hypogynus* flavescens, obscure denticulatus. *Filamenta* alba, fertilia, petalis duplo breviora. *Antheræ* luteæ, apici tenuissimo filamenti insertæ, vix apiculatæ. *Stylus* glaber ut stigma. *Capsulæ* (nonnisi immaturæ visæ) vix sesquiunciam excedentes, fere oblongatæ, apice paulo attenuatæ, glabræ, tuberculis acutis dense onustæ, ad suturas sulcatæ, marginibus valvarum inflexis membranaceis con-

natis læte purpureis. *Semina* curvato-oblonga, membrana tenui alba circumcirca alata.

NAT. ORD. MYRTACEÆ.

Gen. I. HOMALOCALYX, *F. Muell.*

Flores axillares, solitarii, breviter pedunculati, bibracteolati. *Bracteolæ* persistentes, distinctæ, cordato-cymbiformes. *Calycis tubus* obovatus, *compressus*, basi apiceque truncatus, ecostatus; laciniæ deciduæ angusto-lanceolatæ, acuminatæ, petaloideæ, corolla parum breviores. *Petala* acute lanceolata, decidua. *Stamina* 10, libera, petalis paulo breviora, omnia fertilia. *Filamenta* filiformia. *Antheræ* subovatæ, introrsæ, connectivo glanduloso lateraliter adnatæ, biloculares, loculis longitudinaliter dehiscentibus. *Stylus* simplex, filiformis, stamina subæquans, stigmate minimo. *Germen* uniloculare, pauci-gemmulatum. *Fructus* . . .—Fruticulus *ericæus* Australiæ borealis; foliis *alternis, confertis, canaliculato- et acute trigonis, exstipulatis, mucronulatis;* floribus *albis.*—Genus inter *Paryphantum* et *Thryptomenem* medium.

Homalocalyx *ericæus.*

HAB. In plaga elevata, arida, arenosa, inter flumina Roper et Limmen-bight River, eorum originem versus.—(Anth. Jun.–Aug.)

Fruticulus erectus, $\frac{1}{2}$–2′ altus, patentim ramosus. *Folia* numerosissima, parum patentia, nitentia, 4–8‴ longa, $\frac{1}{2}$–$\frac{2}{3}$‴ lata, breviter petiolata. *Pedunculi* $\frac{2}{3}$‴ longi. *Bracteolæ* vix $1\frac{1}{2}$‴ metientes, dimidiam inferiorem tubi calycis amplexantes, glabræ, breviter acuminatæ, virentes, margine membranaceæ. *Calycis* tubus 2‴ longus, laciniæ albæ. *Petala* vix 2‴ longa. *Antheræ* fulvidæ. *Stylus* cum filamentis albus, glaber.

NAT. ORD. UMBELLIFERÆ.

Gen. I. PLATYCARPIDIUM, *F. Muell.*

Flores polygami. *Calyx* minutissime 5-dentatus. *Petala* 5, præfloratione subimbricata, ovata, decidua, apice obtusa et recta. *Styli* brevissimi, subuncinati, convergentes. *Stylopodia* compressa, stylo æquilonga. *Fructus* plano-compressus, didymus; *mericarpia* orbiculari-ovata, sublævis, 5-juga, evittata, jugis lateralibus indistinctis, dorsali fructum marginante, commissuralibus conjunctis. *Carpophorum* . .—Frutex *validus, elatus, glaber,* Australiam subtropicam

orientalem inhabitans; foliis *alternis, oblongis, integerrimis;* petiolis *non vaginantibus;* umbellis *terminalibus, compositis, paniculatis, lateralibus sæpe abortivis;* bracteis *bracteolisque linearibus, liberis;* floribus *flavidis.*—Genus ab *Astrotricha* petalis florum fertilium deciduis, stylis basi incrassatis, et a *Trachymena,* cui habitu approximat, fructu compressissimo lævi, a *Platysace* (quantum e fructu immaturo dejudicari licet) mericarpiis evittatis sicut a *Didisco* (qui etiam involucello recedit) habitu alieno; ab omnibus floribus polygamis diversum.

Platycarpidium *validum.*

HAB. In collibus petræis et virgultis a fluvio Burdekin ad flumen Burnett.—(Anth. vere exeunte.)

Frutex 1–2-orgyalis, raro humilior. *Caulis* robustus, teres, fuscus, lævis. *Rami* patentes, satis graciles, virides, teretiusculi. *Folia* subcoriacea, lanceolato- vel lineari-oblonga, obtusa, plana, in petiolum brevem sensim angustata, vel subsessilia, trinervia, utrinque nitidula, plerumque 1–2″ longa, 1½–4‴ lata. *Umbellæ* 5–7-radiatæ, ramos et ramulos apice aphyllos terminantes. *Bracteæ* pedunculis propriis (radiis) numero æquales, acutæ, 2–4‴ longæ, radiis sæpe duplo breviores, demum deciduæ. *Umbellulæ* simplices vel semicompositæ, 5–13-floræ. *Bracteolæ* pedicellis numero æqualis iisdem parum breviores, lineari-subulatæ. *Pedicelli* floriferi 1–1½‴ longi, nudi vel bracteolis duabus minutis obsessi. *Flores* omnes revera hermaphroditi sed in diversis umbellis germine abortivo steriles, fertiles utplurimum umbellas terminales seu centrales occupantes, abortivos etiam petalorum magnitudine excedentes. *Calycis dentes* triangulares, acuti. *Petala* florum fertilium vix 1‴ longa, ovato-subcordata, supra antice carinulata. *Antheræ* ovatæ, flavidæ, dorsifixæ, loculis discretis longitudinaliter dehiscentibus. *Styli* ½‴ longi, uncinatim incurvi. *Stigmata* minuta, obtusa. *Filamenta* petalis æquilonga, albida, apice tenuissimo incurvo. *Stylopodia* flava. *Mericarpia* immatura, jam 1½‴ longa, aptera, casu tria!, punctis minutissimis conspersa.

BOTANICAL INFORMATION.

Mr. Spruce at Tarapota.

We had been long without intelligence of this excellent and ener-

getic botanist, our latest being dated December 25, 1855, from Tarapota, as announced in our last year's Journal, page 177, on the Hualaga, a tributary of the Amazon, but within the territory of Peru. Again, by the latest mail, from letters received on the 18th of July, 1857, we learn that Mr. Spruce was still at Tarapota, detained, partly by political revolutions and partly by swollen rivers, from proceeding to Quito, his next place of destination. The means of getting there are partly by water, a voyage of two months' duration up the rivers, and partly by land. Another collection of plants is announced as about to be despatched from Tarapota, and among them several sets of Ferns, independent of those distributed by Mr. Bentham with the general collections. We have reason to hope that Mr. William Mitten (Hurstpierpont, Sussex) will kindly undertake the naming and disposal of these Ferns, on the same terms, we presume, as the other plants, namely £2 the 100 species. The *Musci* and *Hepaticæ* of this remarkable journey we believe will be retained till Mr. Spruce's return to Europe.

British North-American Exploring Expedition, under J. PALLISER, ESQ.

Letters have been received at the Colonial Office from Mr. Palliser, commanding the British North-American Exploring Expedition, dated "Isle Royal, Lake Superior, June 12." At this point, Isle Royal, the party first touch British ground. Excellent canoes, with the needful complement of men, were provided at Sault Ste. Marie. These were taken on by the steamer with the party, to Isle Royal, about sixteen or twenty miles from Fort William, the first British Fort on the mainland; and it was fortunate they did not make the voyage in the canoes, for late as it was in the season, they had to plough through seventy miles of drift-ice in the steamer, crushing and thundering as they went along. This, besides avoiding the risk of injury to the boats, was a saving in time of fifteen days. Fort Garry, Red River, Hudson's Bay Company's Territories, will be the party's head-quarters for some time.

Scottish Alpine Plants.

Mr. W. Sutherland, a medical student, of 18, Bon Accord Terrace, Aberdeen, proposes to issue, on his return from Braemar, a few sets of

the rarer plants of the northern Scottish mountains, under the title of *Plantæ Rariores Abredonenses;* the set to consist of four fascicles, price 21*s.* each, containing 100 species, well preserved, correctly named, mounted, and enclosed in a case. This will afford a good opportunity for those untravelled botanists who take interest in the Scottish Flora, to add some of the northern rarities to their collections. The first and second fascicles will consist of Flowering Plants (including the *Hieracia* and other critical species); the third and fourth, the Ferns and other Cryptogamic rarities. Some of Mr. Sutherland's plants which we have seen, were exceedingly well selected and preserved.

Cape de Verde Islands.

Mr. Nathaniel H. Mason (3, Red Lion Square, London), well known for his natural history researches in Madeira, has it in contemplation to proceed to the Cape de Verde Islands during the ensuing winter, and pass ten or twelve months there in forming collections of plants, shells, etc.; and will be happy to receive orders from persons desiring to possess the products of these little-known African islands.

NOTICES OF BOOKS.

An Elementary Course of Botany, Structural, Physiological, and Systematic, with a Brief Outline of the Geographical and Geological Distribution of Plants; by ARTHUR HENFREY, F.R.S., F.L.S., Professor of Botany in King's College, London.

To have three good introductory works upon one branch of science to notice cannot often occur in one year; but so it has happened in this; we have scarcely perused Gray's 'Elements' and Berkeley's 'Introduction to Cryptogamic Botany,' before we find ourselves called upon to enter upon the merits of another contribution to the same class of botanical literature. In saying this, we by no means wish it to be understood that we profess to notice all introductory works; on the contrary, to do so must be an exceptional duty, and only called for when these are published under peculiar circumstances; as when the subject is abstruse and involves a great deal of original research, as in

the case of Berkeley's 'Introduction,' or Lindley's 'Vegetable Kingdom;' or when the book is written to meet the demand of public schools and national institutions, as Gray's 'Lessons;' or when written by men of eminence, who treat the subject with originality as well as learning, as in the case of the work before us.

Professor Henfrey is well known to be a distinguished botanist, and the most skilful and accomplished working physiologist in England, and he is also an able and assiduous professor of many years' standing. During a long period he has had to expound annually his own special branch of botany, as well as the morphological, structural, and systematic, all of which he has diligently studied, to considerable classes of chiefly medical students, who came before him in most cases profoundly ignorant of the commonest attributes of the vegetable kingdom. How to deal with such a class, as that the moderately industrious amongst them shall in three short months obtain a creditable minimum acquaintance with the chief laws of vegetable life, is indeed no easy problem, but is that which he has set himself to master. Ten years ago, Mr. Henfrey says, he attempted to meet the difficulty in part, by publishing his 'Outlines of Structural and Physiological Botany,' a valuable and very carefully written work, but too detailed and profound for the purpose intended, and of which, with a candour which does him honour, he now says further that he entertains "a gradually strengthening conviction, derived from experience in lecturing, that the arrangement of the matter in the 'Outlines' was not that best adapted for the instruction of those for whose use it was intended." Without then at all undervaluing Physiological Botany, the elements of which we think every one should be taught, whether intended for the medical profession or not, we entirely concur with him in the course he has adopted in the present work, regarding which he says: "In the meantime we subordinate it to the other branches in practical teaching, and in this volume have dealt with it in what we regard as its proper place in the order of study." Again, he says: "To direct the attention of the students to a series of isolated facts and abstract propositions relating to the elementary anatomy of plants, is to cause him to charge his memory or his note-book with materials in which he can take but little interest, from his incapacity to perceive their value or applications. But if we endeavour to seize the floating conceptions furnished by common experience, and to fix and define them by a course of exact practical obser-

vation of the more accessible characters of plants,—showing the relations of these as they occur in different divisions of the vegetable kingdom,—we place the student in a position which enables him to proceed at once with an inquiry into the peculiarities of the plants he meets with, and in this way to acquire a fund of practical knowledge, which is not only absolutely requisite before entering upon abstract inquiries, but is especially calculated to secure his permanent interest in the study." This is sound philosophy; it is a return to the Linnæan principles in teaching botany, too long abandoned in this country; it is written in the spirit of the 'Philosophia Botanica,' 'Fundamenta Botanica,' and other classical works of the same great author, which are condemned to neglect by professors, and are never spoken of to students, because Linnæus's artificial classification of his own natural genera has been superseded by Jussieu's natural classification of the genera too.*

It now remains to say a few words on the manner in which Professor Henfrey has executed his plan. After a few introductory pages, the author commences with,—I. Morphology, or the comparative anatomy of plants; and then proceeds to, II. Systematic Botany; III. Physiology; and IV. Geographical and Geological Botany. This course enables him to begin at once with botany in its most objective form. After a few remarks on general morphology, in which the nature of the subject is explained, the student is shown some flowering plants, and taught their organs, from the root to the seed, with the order and method of evolution of each. Surely this is the right way

* The real merits of Linnæus as a natural systematist have never been appreciated. In the well-deserved admiration of the labours of the Jussieus, it is invariably forgotten that the efforts of genius displayed by Linnæus in constructing natural genera was as great as that of the Jussieus in classifying these into genera of a higher value, now called Natural Orders; and considering the chaotic state that both the genera and species were in upon which Linnæus worked, and the vast number of new forms he first naturally grouped under genera, the amount of labour, skill, and knowledge expended in the effort are what can now never be fully realized. The history of our system presents but four very salient points:—1. Ray's division of plants into Phænogams and Cryptogams, and the former into Monocotyledons and Dicotyledons; 2. Linnæus forming natural groups called genera, and rendering these accessible to scientific minds by a binomial nomenclature, and by artificial (in some degree natural) classes and orders; 3. Jussieu's combining the natural genera under truly natural orders and artificial subclasses, which he could never have done but for the means of acquiring and grouping the facts that Linnæus's labour supplied; 4. the separating Gymnosperms, by Brown: this is the first step towards a natural classification of the Jussieuan Orders of Dicotyledons, which is the great desideratum in systematic botany.

to begin, considering the state of ignorance of the students upon whom the Professor works; and not, as is usually the case, with cells, cytoblasts, proximate principles, and protein compounds, which the student is too often taught before he can define a root or a leaf, or distinguish a root from a stem, or the parts of a flower. This department once acquired (and it need not be pursued into detail yet), and the student is prepared to understand the principles of classification which are founded on the facts in comparative anatomy he has learned, and every step he takes in which developes more knowledge of comparative anatomy, and impresses on his mind all that he has learned previously.

To teach physiology, which comes next, is impossible without a constant reference to specimens and their organs; and if these are treated as abstractions, which they must be if the student is ignorant of comparative anatomy and system, it is obvious that he can only learn physiology by rote, by an effort of memory and not by an effort of mind; he cannot advance a step beyond his professor or his book, and can do nothing for himself, either as an observer or thinker. To learn any branch of botany in such a way is opposed to all scientific principles, and most especially to those that apply to the sciences of observation, and the wonder is that it should ever be attempted; but such we know to be the case in most medical schools, and can only hope that the spontaneous testimony to its futility now offered by one of their most distinguished professors will be duly appreciated. The physiological section Mr. Henfrey properly divides into two branches, physiological anatomy and the physiology of vegetation, the latter being physiology in the strict sense of the term. A chapter on Miscellaneous Phenomena follows, and then the chief facts connected with Geographical and Geological Botany.

With regard to the execution of the work, we can award it very high praise indeed; there is a great deal of originality in the way the subjects are introduced and discussed; and the morphological and physiological parts abound with evidence of the great amount of care and thought expended on the treatment of the simplest subjects as well as the most abstruse. The physiological part is the best, as was to be expected from the author's eminence in that department, and this, together with the pages devoted to the extremely difficult subject of Cryptogamic reproduction, seem to us admirably done. The general discussions on nomenclature, classification, and the evolution of organs, are

also well worth perusal even by botanists skilled in these branches. Great care and judgment have been exercised in avoiding all unnecessary terms, and in being very explicit in the use of those chosen; this is an immense benefit to the student and general reader, and to this, and the excellent tone with which all matters are discussed, we owe the pleasure with which we have perused the work. There is no attempt at popular writing in any part of the book; no crowding of conflicting opinions of other authors; the Professor is supposed by his pupils to know which side to take and teach on a disputed point, and he takes it on his own responsibility, without dogmatism, and generally, in our opinion, he takes the right.

In a work of such scope there must be some inequality in point of execution, and as we have so much freely to praise, we have less scruple in noticing the only two obvious defects of much importance; such are some very serious mistakes in the descriptions of Natural Orders, and an incredible number in the few pages devoted to an amplification of Schouw's phyto-geographic regions, which is an unfortunate attempt to better a bad thing, and has resulted in making bad worse. This however scarcely affects the general utility of the book, which we can cordially recommend, as equally honourable to its talented author and well adapted to its purpose.

It remains to add that the work is well illustrated with woodcuts, of unequal merit, but many of them excellent.

GRAY, DR. ASA; *List of Dried Plants collected in* JAPAN *by* S. Wells Williams, Esq., *and* Dr. James Borrow. 4to.

This list of Japan Plants (more than a list, for it contains characters and descriptions of the new species) is particularly acceptable at this time, now that there is some prospect of that country being made more accessible to Europeans and to men of science, and that we have ourselves a botanical collector *en route* for the Japanese Islands.

We do not gather from the brief Preface on what particular occasion these gentlemen visited Japan, but one of them, Mr. Williams, was of the American Mission at Macao, and the present collection was principally made in the *northern* part of Japan. It was hence naturally expected that it would add to the Japanese Flora a considerable num-

ber of species identical with, or closely allied to, those already known to inhabit Kamtchatka and North-west America. This Dr. Gray found to be the case; "and at the same time it has brought to view an equal number of Eastern United States forms, no insignificant portion of which are specifically identical." We regret that "another and perhaps a larger collection of Japanese plants" could not at the same time have been published, we mean that made by "the excellent and most assiduous collector, Mr. Charles Wright, in the North-Pacific Exploring Expedition, under Commodore Rogers."

The work, of twenty-eight quarto pages, makes known forty new species and one new genus: of these thirteen are *Carices*, elaborated by Dr. Boott, while Mr. Daniel C. Eaton determined the Ferns, Mr. Sullivant the Mosses, and Dr. Harvey the Algæ.

It is not a little interesting to see how many European, and even English plants, are found to be natives of Japan, and these scarcely likely to be introduced by accident or design; viz. *Ranunculus sceleratus*, *R. repens ?*, *Caltha palustris*, *Pæonia officinalis*, *Berberis vulgaris*, *Chelidonium majus*, *Nasturtium palustre*, *N. officinale*, *Turritis glabra*, *Arabis hirsuta*, *A. alpina*, var. ?, *Arabis lyrata*, *Cardamine impatiens*, *Draba nemorosa*, *Capsella Bursa-pastoris*, *Viola palustris*, *V. canina*, var. ?, *Arenaria serpyllifolia*, *Stellaria media*, *S. uliginosa*, *Malachium aquaticum*, *Cerastium viscosum*, *Oxalis corniculata*, *Vicia sativa*, *Vicia tetrasperma*, *Lathyrus maritimus*, *Lotus corniculatus ?*, *Medicago lupulina*, *Pyrus Malus*, *Archangelica officinalis ?*, *Asperula odorata*, *Galium Aparine*, *Lappa major*, *Picris hieracioides*, *Taraxacum Dens-leonis*, *Sonchus asper*, *Pyrola rotundifolia*, *Plantago media*, *Veronica Anagallis*, *Verbena officinalis*, *Prunella vulgaris*, *Lamium amplexicaule*, *Nepeta Glechoma*, *Myosotis arvensis*, *Solanum nigrum*, *Menyanthes trifoliata*, *Polygonum aviculare*, *P. Convolvulus*, *Rumex crispus*, *Euphorbia Helioscopia*, *Convallaria majalis*, *Luzula campestris*, *Alopecurus geniculatus*, *Polypogon Monspeliensis*, *P. littoralis*, *Poa annua*, *Glyceria fluitans*, *Triticum caninum*, *Avena sativa*, *Hierochloe borealis*, and *Equisetum arvense*.

Native specimens of the *Dicentra* or *Dielytra* (De Cand.) *spectabilis* prove that that most lovely plant is a native, not of China proper, as many have supposed (see the remarks in Bot. Mag. at tab. 4458), but of North Japan, and this accounts for its being so hardy with us.

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1. SULLIVANT, W. S.; *The* MUSCI *and* HEPATICÆ *of the* UNITED STATES *east of the Mississippi River.* Contributed to the Second Edition of Gray's 'Manual of Botany,' with Eight Copper-plates illustrating the Genera. 8vo. New York, 1856.
2. MUSCI BOREALI-AMERICANI, *quorum specimina exsiccata* W. S. SULLIVANT *et* LESQUERREUX *ediderunt.* Columbi Ohioensium, sumptibus auctorum, 1856. (Accompanied by a volume of specimens in folio.)

Thanks to the impetus given to general botany in the United States towards the end of the last century, by such men as Elliott, Nuttall, etc. etc., and in the Cryptogamia by Mühlenberg, the science has progressed in a remarkable manner, and those zealous men have been succeeded by Messrs. Torrey and Gray and others in the first-mentioned department, who have contributed largely to the knowledge of the botany of other countries, as well as to that of the United States, while again Messrs. Sullivant and Lesquerreux, Tuckermann, and Curtis, etc., have done no less for Cryptogamic Botany. Mr. Tuckermann's works on the Lichens of the United States we have noticed with much satisfaction in this journal, and we have briefly alluded to the 'Musci and Hepaticæ of the United States,' by Mr. Sullivant, in connection with the second edition of Dr. Asa Gray's 'Manual of the Botany of the Middle United States,' in which the *letter-press* of the first article which heads this notice appeared, exactly as in the present form. Here that letter-press appears apart from the Manual, in a large octavo, accompanied by a brief Preface, and, what is of still more consequence to the student, with admirably executed figures illustrative of all the genera, somewhat after the model of Hooker and Taylor's 'Muscologia Britannica,' only that here the *Hepaticæ* are included, and the genera are much more numerous than were adopted at the period when that work appeared, for it includes all the recent genera usually adopted by the most distinguished Muscologists, and some new ones are formed by Mr. Sullivant himself.

This is indeed an excellent manual of all the known *Mosses* and *Hepaticæ* hitherto detected in that portion of the United States lying east of the Mississippi river, and not wholly confined to that; "a few species found elsewhere, either new, or having a geographical range heretofore unnoticed, or for some other special reason, have also been

described, viz. those from Texas and New Mexico, and also several from near our northern boundary, and likely to occur within it" (p. 3).

The following notes at the same page just mentioned are worthy of attention:—

"The territory within the limits adopted, extending as it does from 25° to 47° north latitude, and traversed for nearly its entire length by mountain ranges, reaching at several points in their northern and southern terminations an alpine elevation, presents conditions favourable to a copious and varied muscological vegetation; and if the number of species here recorded is not so large as that found in an equal area similarly situated on the eastern continent, it must be borne in mind that our Bryology and Hepaticology (particularly the latter) have thus far been imperfectly investigated. Scarcely any portion of our country, excepting Central Ohio, has been carefully examined. The mountain ranges have only been cursorily visited by a few interested in these branches of botany. In the northern section, notwithstanding numerous discoveries made by the late Mr. Oakes, and the more recent ones (among them a *Dichelyma*, a *Tetrodontium*, and an *Atrichum*) by Thomas P. James, Esq., there will doubtless yet be detected many other well-known European species, not a few of which have already been collected in British America by Drummond.

"The southern section has been even less carefully explored, and offers a promising field for future discoveries. Among the recent accessions to our Flora from this quarter are an *Orthotrichum*, a *Fissidens*, and several *Bruchiæ* and *Fabroniæ*, gathered by H. W. Ravenel, Esq., also some fine *Sphagna*, an *Anomodon*, a *Fontinalis*, and a *Macromitrium*, brought thence by our friend, the excellent Bryologist, M. Leo Lesquerreux.

"No portion of our territory has contributed so little to our Bryology and Hepaticology as the Florida peninsula, which in this respect still remains almost a *terra incognita*, its only known species, *Pylotrichum cymbifolium*, like *Meteorium pendulum*, from Western Louisiana (whence novelties may also be expected), is thoroughly tropical in all its characters, and gives promise of new and interesting forms to reward future explorers."

The volume opens with the characters of the Order Musci. Then follows an Artificial Analysis of the Genera: the characters principally derived from the nature, or presence or absence of the peristome, the

form and structure of the calyptra, capsule, etc.; and then the genera, with more full characters, and the species arranged in Natural Families, but to which, as in the work of Mr. W. Wilson on British Mosses, *no characters* are assigned; so that, but for the key on the artificial system, a tyro would find it impossible to make practical use of the work.

Thus disposed, the number of genera of United States *Mosses* amounts to 80; of species to 396; of *Hepaticæ*, 38 genera and 108 species. A full Index of the genera and species follows, and then seven closely printed pages of Explanation of the Plates. These latter are eight in number, drawn, we believe, and engraved by Mr. Sullivant's own hands, and admirably exhibiting such clear analysis of the structure of all the genera, both of *Musci* and *Hepaticæ*, that they that run may read; and our authors have, by this work, rendered the most essential service to the cause of Muscology, both in America and throughout Europe; for many of the genera, and not a few of the species, are identically the same in the two countries.* The arrangement of these plates, and the placing several genera on each page, are attended with this great advantage, that not only are the characters of the genera clearly defined, but their resemblance to, or difference from, allied genera are at once seen.

The 'Specimina Exsiccata' are beautifully arranged in a folio form, each on separate paper, so as to be easily detached, if necessary. The samples are extremely perfect, and each has a corresponding number with those in the descriptive volume; and it must rank as the best series of specimens of Mosses, both for beauty and scientific arrangement, of any that has yet appeared.

* A useful plan is here adopted of putting "*Eu.*" (Europe) to such species as are common to the two countries. Thus we find that of *Sphagnum*, 7 out of 16 are European; of *Andreæa* all are so; of *Phascum*, 11 out of 17; of *Dicranum*, all (23); of *Fissidens*, 5 out of 12; of *Trichostomum*, 4 out of 5; of *Barbula*, all the 8; of *Encalypta* all (4); of *Zygodon*, 2 out of 3; of *Orthotrichum*, 13 out of 17; of *Polytrichum* all (5); of *Bryum*, 23 out of 24; of *Mnium*, 8 out of 9; of *Bartramia*, 6 out of 7; of *Splachnum* (verum), the only 2 species are European; *Spl. angustatum* and *S. mnioides* are referred to *Tetraplodon*; of *Anomodon*, 4 out of 7; of *Leskea*, 2 out of 5; of *Hypnum*, 57 out of 86, etc.

Enumeration of the MOSSES *collected in* India *by* DR. J. D. HOOKER, F.R.S., *and* DR. THOMAS THOMSON, F.R.S., *with their habitats, elevations, and the numbers under which they have been distributed; arranged by* W. MITTEN, ESQ., *and named by* W. WILSON, ESQ.

(*Continued from p.* 300.)

No. 44. Trichostomum? *pellucidum*, Wils. MSS.—HAB. Ceylon, near Batticaloa, *Gardner*.

140, 141. Trichostomum *corniculatum*, Schwgr.? (but monoicous! or possibly a state of *Tortula anomala*).—HAB. Tibet occid. temp.; Tarkiti, Indus valley, alt. 8,000 ped., T. T.

142, 183. *Id.*—HAB. Himalaya bor.-occid. temp.; Kumaon et Simla, alt. 6–7,000 ped., T. T.

139. Tortula *anomala*, Bryol. Eur.—HAB. Tibet occid. alp.; Nako-to-Chango, Piti, alt. 13,000 ped., T. T.

126. Trichostomum *brachyphyllum*, Wils. MSS.—HAB. Tibet occid.; Iskardo, Balti, alt. 7,000 ped., T. T.

162. Trichostomum *orientale*, C. Müller, Tortula *Indica*, Hook. et Grev. (Trichostomum) *T. orientale*, C. Müller, i. 568.—HAB. Ceylon, Point Galle, *Gardner*.

25. Trichostomum *tenue*, Bryol. Eur.?—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 9,000 ped., J. D. H.

41. *Id.*—HAB. Sikkim-Himalaya alpina; Jongri, alt. 12–13,000 ped., J. D. H.

165. Trichostomum *tortile*, Schrad.—HAB. Sikkim-Himalaya temperata; clay banks, Darjeeling, alt. 7,000 ped., J. D. H.

21. Trichostomum *homomallum*, Br. Eur.—HAB. Nipal orient. alp.; Wallanchoon, alt. 13,000 ped., J. D. H.

24. *Id.*—HAB. Nipal orient. temp.; Phulloot, alt. 9,000 ped., J. D. H.

8, 9. Trichostomum *delicatulum*, Wils. MSS.—HAB. Sikkim-Himalaya temperata, alt. 8–11,000 ped., J. D. H.

7. Var. (minor).—HAB. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

42. Leptotrichum *tortuosum*, Wils. MSS. (*L. Boryano*, C. Müll., affin.; v. C. Müll. i. 452).—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

101. Trichostomum *tophaceum*, Brid.—Tibet occid.; Piti, T. T.

268. Tortula *rigida*, Hook. et Tayl.—HAB. Tibet occid.; Khapalu, Shayuk valley, T. T.

260 *b*. Tortula *angustifolia*, Hook. et Grev.—HAB. Ceylon, *Gardner*.

160. Var.—HAB. Ceylon, *Gardner*.

171. Tortula *crispula*, Wils. MSS.—HAB. Nipal orient.; Tambur river, J. D. H.

189. Tortula *flavescens*, Hook. et Grev., var.?—HAB. Himalaya bor.-occid. temp.; Simla, alt. 9,000 ped., T. T.

258. Tortula? (*T. vineali* affin.) (sterile).—HAB. Tibet occid. alp.; mountains above Le, alt. 12–18,000 ped., T. T.

170. Tortula *vinealis*, Brid., var.?—HAB. Nipal orient. temp.; Tambur river, alt. 7,000 ped., J. D. H.

173. *Id.*—HAB. Himalaya bor.-occid. temp.; Kumaon, alt. 6,000 ped., J. D. H.

143. Tortula *fallax*, Hedw.—HAB. Tibet occid. temp.; Shayuk valley, alt. 9,000 ped., T. T.

169. Var.?—HAB. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

185. Barbula *comosa*, Dz. et Molk.? (C. Müll. i. 610).—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

166. Tortula *apiculata*, Wils. MSS. (*T. unguiculatæ* aff. fol. brevioribus).—HAB. Nipal orient.; Tambur river, alt. 8–10,000 ped., J. D. H.

153. Tortula? (sterile). (Allied to the last, and to *T. paludosa*).—HAB. Himalaya bor.-occid. temp.; Simla, alt. 7,000 ped., T. T.

158. Barbula *squarrosa*, Bryol. Eur.—HAB. Himalaya bor.-occid. temp.; Simla, alt. 7,000 ped., T. T.

175, 175 *b*, 175 *c*. Barbula *inermis*, Mont.—HAB. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

164. Tortula *cacuminata*, Wils. MSS. (sterile).—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 9,000 ped., J. D. H.

164 *b*. *Id.* (with *Trichostomum Bombayense*, C. Müll. ii. 628, intermixed).—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 9,000 ped., J. D. H.

257. Tortula *rosulata*, Wils. MSS. (allied to *Barbula mollis*, B. et S.).—HAB. Tibet occid. alp.; mountains above Le, alt. 12–18,000 ped., T. T.

174. Tortula *ruralis*, Hedw., var.?—HAB. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

172. Tortula *lævipila*, Schwgr., var.? vel sp. affin. (dioic.?).—HAB. Sikkim-Himalaya alpina; Donkia Pass, alt. 16,000 ped., J. D. H.

192. *Id.?*—HAB. Tibet occid. alp.; top of Hera La, alt. 18,700 ped., *H. Strachey.*

277. Cinclidotus *fontinaloides*, P. Beauv.—HAB. Tibet occid. temp.; Iskardo, Balti, alt. 7–8,000 ped., T. T.

286. Schistidium *apocarpum*, Br. Eur., var.—HAB. Himalaya bor.-occid. temp.; Simla, alt. 8,000 ped., T. T.

318. *Id.*—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

168. Var. alt.—HAB. Sikkim-Himalaya temperata; Lachoong, alt. 4–7,000 ped., J. D. H.

184. Var. alt. (with *Tortula fallax*, var. *brevifolia?*).—HAB. Nipal orient. alp.; Wallanchoon, alt. 14,000 ped., J. D. H.

178. Grimmia? *remota*, Wils. MSS. (sterile) (with *Bryum*, near *B. Billardieri*).—HAB. Nipal orient.; Tambur river, J. D. H.

287, 288, 289, 290. Grimmia *anodon*, Br. et Sch., var.—HAB. Tibet occid. temp.; Kartakshen, Iskardo, Balti, Indus valley, alt. 8,000 ped., T. T.

281. Grimmia? *incana*, Wils. MSS. (sterile).—HAB. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

311. *Id.* var.? (♂ plt.), fol. submuticis.—HAB. Himalaya bor.-occid. temp.; Kishtwar, alt. 6,000 ped., T. T.

248. Grimmia *funalis*, Bryol. Eur., var. fol. submuticis.—HAB. Nipal orient. alp., alt. 14,500 ped., J. D. H.

294. Grimmia *reduncа*, Wils. MSS. (*G. uncinatæ* affin.)—HAB. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

293. Grimmia *orientalis*, Wils. MSS. (*G. sulcatæ* et *alpestri* affin.) (with *Andreæa petrophila*, var., on same paper, not mixed, see 4).—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

329. Grimmia *lurida*, Wils. MSS. (*G. montanæ*, Br. Eur., affin.)—HAB. Ceylon, *Gardner.*

285. *Id.*—HAB. Sikkim-Himalaya temperata; Lachen, alt. 10,000 ped., J. D. H.

316. Grimmia *oblonga*, Wils. MSS. (*G. apiculatæ* affin.) (intermediate between *G. mollis*, Br. Eur., and *G. ovata*).—HAB. Sikkim-Himalaya alpina; Jongri, alt. 12,000 ped., J. D. H.

296. Grimmia *subfusca*, Wils. MSS. (*G. leucophææ* affin.) (sterile);

gracilior, fol. angustioribus.—Khasia temperata; Kollong, alt. 5,000 ped., J. D. H.

284, 291, 320. Grimmia *ovata*, Web. et M. (with *G. subfusca*, but not mixed, on same paper).—Hab. Sikkim-Himalaya alpina, alt. 9–12,000 ped., J. D. H.

299, 307, 328. Grimmia *ovata*, W. et M.—Hab. Sikkim-Himalaya alpina, 15,500 ped., J. D. H.

325. *Id.*—Hab. Nipal orient. alp.; Wallanchoon, alt. 13,000 ped., J. D. H.

283. Var. monoic.—Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

327. Grimmia *commutata*, Hub. (dioic.)—Hab. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

282. *Id.*—Hab. Himalaya bor.-occid. temp.; Kashmir, alt. 5,500 ped., T. T.

317. *Id.?*—Hab. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

279. *Id.?* (sterile).—Hab. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

295. Grimmia *atrata*, Mellich. — Hab. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

310. Racomitrium (allied to *R. protensum*, A. Braun) (sterile).—Hab. Ceylon, *Gardner*.

321. Racomitrium *fasciculare*, Brid., var. minor.—Hab. Sikkim-Himalaya alpina; Lachen, alt. 13,000 ped., J. D. H.

314. *Id.* (sterile).—Hab. Sikkim-Himalaya alpina; Lachoong, alt. 14,000 ped., J. D. H.

313, 322. Racomitrium *heterostichum*, Brid.—Hab. Nipal orient. alp.; Wallanchoon, alt. 12–14,000 ped., J. D. H.

298, 326. Racomitrium *pumilum*, Wils. MSS. (allied to the last).—Hab. Sikkim-Himalaya temperata; Lachen, alt. 4–8,000 ped., J. D. H.

323. Racomitrium *microcarpum*, Brid., var.—Hab. Nipal orient. alp.; Wallanchoon, alt. 13,000 ped., J. D. H.

304. Racomitrium *fuscescens*, Wils. MSS. (*R. heterosticho* affin.); fol. patulo-squarrosis.—Hab. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

303. Racomitrium *subsecundum* (*Trichostomum subsecundum*, Hook. et Grev.); var. fol. piliferis (*R. carnosum*, Wils. MSS).—Hab. Sikkim-Himalaya temperata; Tonglo, 8–9,000 ped., J. D. H.

302. *Id.*—HAB. Sikkim-Himalaya alpina; Jongri, alt. 12,000 ped., J. D. H.

312. *Id.*—HAB. Nipal orient. temp.; Tambur river, alt. 7,000 ped., J. D. H.

308. *Id.*—HAB. Ceylon, *Gardner*.

324. *Id.?* (sterile).—HAB. Nipal orient. temp.; Fir-forests, Kambachen, alt. 12,000 ped., J. D. H.

280. Var. alt.—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 9,000 ped., J. D. H.

300. *Id.?* (sterile).—HAB. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

301. Var. alt. (minor).—HAB. Nipal orient. temp.; Kambachen, alt. 11,000 ped., J. D. H.

305. Var. alt.?—HAB. Sikkim-Himalaya temperata; rocks, Lachen, alt. 11,000 ped., J. D. H.

306. Racomitrium *canescens*, Brid., var. *ericoides*.—HAB. Sikkim-Himalaya alpina; Yeumtong, alt. 12,000 ped., J. D. H.

315. Racomitrium *lanuginosum*, Brid.—HAB. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 16,000 ped., J. D. H.

309. Var.—HAB. Nipal orient. alpina; Kambachen, alt. 14,000 ped., J. D. H.

245, 246, 247, 249. Ptychomitrium *speciosum*, Wils. MSS. (*Didymodon Tortula*, Harvey!).—HAB. Nipal orient. temp., alt. 8–12,000 ped., J. D. H.

250. Encalypta *commutata*, Nees et Hsch.? vel sp. nov. affinis, capsula subapophysata, folia haud papillosa.

237. Drummondia *brevifolia*, Wils. MSS. (*D. clavellato* diversa).—HAB. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

204. Zygodon *obtusifolius*, Hook.—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 8–9,000 ped., J. D. H.

198. Zygodon *brevisetus*, Wils. MSS. (*Z. conoideo* aff.)—HAB. Nipal orient. alp.; Kambachen, alt. 8,000 ped., J. D. H.

292. Zygodon? (*viridissimo* affin.) (sterile).—HAB. Nipal orient. alp.; Wallanchoon, alt. 13,000 ped., J. D. H.

127. Anœctangium *pusillum*, Wils. MSS. (no fruit).—HAB. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

200, 201, 205. Anœctangium *crispulum*, Wils. MSS. (*A. compacto* divers.)—HAB. Sikkim-Himalaya temperata, alt. 7–9,000 ped., J. D. H.

199. *Id.*—Hab. Himalaya bor.-occid. temp.; Hattu, Simla, T. T.

197. *Id.*—Hab. Nipal orient. alp.; Wallanchoon, alt. 12,000 ped., J. D. H.

203. Anœctangium *compactum*, Schwgr., var.?—Hab. Sikkim-Himalaya alpina; Lachoong, alt. 15,000 ped., J. D. H.

196. *Id.* (sterile).—Hab. Sikkim-Himalaya alpina; Lachen, alt. 15,000 ped., J. D. H.

202. Var. forma gracilior?—Hab. Nipal orient. temp.; Tambur river, alt. 8–10,000 ped., J. D. H.

156. *Id.*—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

207. Anœctangium *tortifolium*, Wils. MSS. (*L. crispulo* aff.) (no fr.) ♀ fl. only.—Hab. Himalaya bor.-occid. temp.; Simla, alt. 7,000 ped., T. T.

210. Orthotrichum *cupulatum*, Hoffm.—Hab. Himalaya bor.-occid. temp.; Kashmir, alt. 5,500 ped., T. T.

210 *b*. Orthotrichum *anomalum*, Hedw.—Hab. Himalaya bor.-occid. temp.; Kashmir, alt. 5,500 ped., T. T.

251. Var.? (vel sp. nov. affinis?)—Hab. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

208. Orthotrichum *rupestre* (Schleich.), var. capsula sublævi.—Hab. Himalaya bor.-occid. temp.; Kashmir, alt. 8,000 ped., T. T.

252. Orthotrichum *alpestre*, Hornsch. (Bryol. Eur.)?—Hab. Himalaya bor.-occid. temp.; Kashmir, alt. 8,000 ped., T. T.

212. Var.? fol. patentib. capsula exserta longiori.—Hab. Himalaya bor.-occid. temp.; Chenab valley, alt. 6–7,000 ped., T. T.

297. Orthotrichum (sterile), allied to the next.—Hab. Sikkim-Himalaya alpina; Donkia Pass, alt. 18,000 ped., J. D. H.

211. Orthotrichum *speciosum* (Nees ab E.), var.—Hab. Tibet occid. alp.; top of Hera La, alt. 18,700 ped., *H. Strachey*.

209. Orthotrichum *leptocarpon*, Br. et Sch.?—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

193. *Id.?*—Hab. Tibet occid. alp.; top of Hera La, alt. 18,700 ped., *H. Strachey*.

215. Orthotrichum *Hookeri*, Wils. MSS. (*O. elongato*, Tayl., affine; aspect of *Macromitrium*).—Hab. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

213, 217. *Id.*—Hab. Nipal orient. temp. et alp.; Wallanchoon, alt. 10–13,000 ped., J. D. H.

216, 244. Orthotrichum *robustum*, Wils. MSS. (*O. luteolo* aff.)—HAB. Sikkim-Himalaya temperata; Lachen, alt. 7–11,000 ped., J. D. H.

216. *Id.* — HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

219. Var. fol. longiorib.—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

224. Macromitrium *Perrottetii*, C. Müller (1, 721), var. seta capsulaque brevioribus.—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 9,000 ped., J. D. H.

226. Macromitrium *parvulum*, Wils. MSS.—HAB. Ceylon, *Gardner*.

230, 225. Macromitrium *Reinwardti*, Schwgr. — HAB. Ceylon, *Gardner*.

229. Ditto, var.—HAB. Ceylon, *Gardner*.

221. Macromitrium *pileatum*, Wils. MSS. (vix *M. involutifolii* var.) —HAB. Mont. Khasia subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

222. *Id.?*—HAB. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

255. Macromitrium *tortuosum*, Wils. MSS. (*M. Japonicæ*, Dz. et M., affin.) — HAB. Mont. Khasia temperata; Myrung, alt. 5,000 ped., J. D. H. et T. T.

206. *Id.*—HAB. Sikkim-Himalaya temperata; Lachen, alt. 7,000 ped., J. D. H.

256. Macromitrium *Moorcroftii* (*Orthot.*, Hook.).—HAB. Mont. Khasia trop.; Nunklow, alt. 2–3,000 ped., J. D. H. et T. T.

220. Var.—HAB. Himalaya occid. temp.; Kumaon, alt. 6,000 ped., T. T.

242. Macromitrium *Moorcroftii.*—HAB. Mont. Khasia temperata; Kollong, J. D. H. et T. T.

238. *Id.*—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

228. *Id.*—HAB. Mont. Khasia temperata, alt. 4,000 ped., J. D. H. et T. T.

243. *Id.*—HAB. Nipal orient.; Myong valley, alt. 4,000 ped., J. D. H.

218. Macromitrium *Nepalense* (*Orthot.*, Hook.).—HAB. Sikkim-Himalaya temperata, alt. 5–8,000 ped., J. D. H.

214. *Id.*—HAB. Sikkim-Himalaya trop.; on old wood, Tista river, alt. 2,000 ped., J. D. H.

231, 232, 234. Macromitrium *corrugatum*, Wils. MSS. (vix *M. sulcatæ* var.)—Hab. Ceylon, *Gardner*.

223, 236, 239, 241. Macromitrium *sulcatum* (*Orthot.*, Hook. et Grev.).—Hab. Mont. Khasia temperata et subtrop., alt. 4–5,000 ped., J. D. H. et T. T.

254. Var.—Hab. Ceylon, *Gardner*.

240. Var.—Hab. Mont. Khasia; Moflong, alt. 5–6,000 ped., J. D. H. et T. T.

227. Var.? capsula oblonga.—Hab. Ceylon, *Gardner*.

Nilgiri, 35, var.?

Nilgiri, 33, M. *Neilgheriense*, C. Müll., var.?

233, 253. Macromitrium *longifolium* (*Orthot.*, Hook.), var. fol. angustiorib., *M. tersum*, Wils. MSS.—Hab. Ceylon, *Gardner*.

364. Funaria *pallens*, Wils. MSS. (*F. Mühlenbergii* sp. aff.)—Hab. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

366. Ditto, var.—Hab. Khasia trop.; Nurtiung, alt. 2–3,000 ped., J. D. H. et T. T.

332, 331, 352, 354, 335. Funaria *microstoma* (Bryol. Eur.).—Hab. Tibet occid. temp. et alp., alt. 12–13,000 ped., T. T.

362, 351, 350, 357, 358, 360. Funaria *hygrometrica*, Hedw., var.? —Hab. Tibet occid. temp., alt. 10–12,000 ped., T. T.

371. *Id.* var.?—Hab. Tibet occid. temp., alt. 10,000 ped., T. T.

330, 342, 338, 346. Funaria *hygrometrica*.—Hab. Himalaya bor.-occid. temp.; Simla, Kishtwar, etc., alt. 8–15,000 ped., T. T.

353. *Id.*—Hab. Planitie Gangetica superiora ad Ferozepore, T. T.

339. *Id.*—Hab. Ceylon, *Gardner*.

333. Var. (small form).—Hab. Himalaya occid. temp.; Simla, alt. 7–8,000 ped., T. T.

349. Funaria *hygrometrica*, Hedw., var.—Hab. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

343, 368. Funaria *hygrometrica*, var. seta longiore (verging into *F. calvescens*, Schwgr.).—Hab. Mont. Khasia subtrop., alt. 4–5,000 ped., J. D. H. et T. T.

340, 367, 363, 372, 347. *Id.*—Hab. Himalaya occid. temp.; Simla, alt. 5–9,000 ped., T. T.

365, 345. *Id.*—Hab. Sikkim-Himalaya temperata, alt. 8–10,000 ped., J. D. H.

369, 370. *Id.*—Hab. Nipal orient. temp., alt. 9–13,000 ped., J. D. H.

347, 345, 334, 344. Funaria *hygrometrica*, var. γ *calvescens*.—HAB. Sikkim-Himalaya temperata, alt. 5–10,000 ped., J. D. H.

336, 337. *Id.*—HAB. Himalaya occid. temp., alt. 6–8,000 ped., T. T.

356. Entosthodon *flavescens*, Wils. MSS. (vix *E. ericetorum* var.)—HAB. Ceylon, *Gardner*.

355. Physcomitrium *nutans*, Wils. MSS.—HAB. Planitie Gangetica ad Moradabad, T. T.

361. Mixture of Physcomitrium *acuminatum*, Br. et Sch., var.; P. *pyriforme*, Brid., var.; P. (nov. sp.); P. *immersum*, Wils. MSS., Gymnost. *Nilotico* (Delille) affin., fol. integerrimis.—HAB. Planitie Gangetica ad Ferozepore, T. T.

348. Meesia *uliginosa*, Hedw.—HAB. Sikkim-Himalaya alpina; Lachoong, alt. 14,000 ped., J. D. H.

379. Voitia *stenocarpa*, Wils. MSS. (if not *V. nivalis* var.)—HAB. Sikkim-Himalaya temperata; Lachoong, alt. 4–7,000 ped., J. D. H.

386, 389. Orthodon *serratus*, Bory (*Octoblepharum*, Hook.).—HAB. Sikkim-Himalaya temperata; Lachen, alt. 5–10,000 ped., J. D. H.

387. Orthodon *subglaber*, Griffith (387).—HAB. Sikkim-Himalaya temperata; Pemiongchi, alt. 7,000 ped., J. D. H.

388. *Id.*—HAB. Nipal orient. temp.; Tambur river, alt. 7,000 ped., J. D. H.

390. *Id.* (calyptra almost naked, nerve more excurrent than in *O. serratus*).—HAB. Khasia temperata; Moflong, alt. 6,000 ped., J. D. H. et T. T.

375. Tetraplodon *angustatus*, Bryol. Eur., var.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H. (Also *T. urceolatus* on same paper.)

276. Tetraplodon *urceolatus*, Bryol. Eur.—HAB. Himalaya occid. temp.; Simla, alt. 7–8,000 ped., T. T.

380, 382, 383. *Id.*—HAB. Sikkim-Himalaya alpina, alt. 13–15,000 ped., J. D. H.

384. *Id.*—HAB. Sikkim-Himalaya; Lachen-Lachoong, alt. 6,000 ped., J. D. H.

378. Var., apophysi subglobosa.—HAB. Sikkim-Himalaya temperata; Lachoong, alt. 4–7,000 ped., J. D. H.

374. Var.?—HAB. Sikkim-Himalaya temperata; Lachen, alt. 9,000 ped., J. D. H.

373. Var. alt.?—HAB. Sikkim-Himalaya alpina; Lachen, alt. 14,000 ped., J. D. H.

381. Tetraplodon *mnioides*, Bryol. Eur.—HAB. Sikkim-Himalaya temperata; Chola, alt. 10–12,000 ped., J. D. H.

385 *b*. *Id.*—HAB. Sikkim-Himalaya alpina; Lachen, alt. 14,000 ped., J. D. H.

385. *Id.* (smaller form).—HAB. Sikkim-Himalaya alpina; Lachen, alt. 14,000 ped., J. D. H.

377. Var. (still smaller form).—HAB. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

551. Brachymenium *Nepalense*, Hook.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

507. Var.?—HAB. Sikkim-Himalaya temperata; Lachen, alt. 8,000 ped., J. D. H.

521, 527. Brachymenium *Nepalense*.—HAB. Sikkim-Himalaya temperata; alt. 8–10,000 ped., J. D. H.

529. *Id.?*—HAB. Nipal orient. temp.; Myong valley, alt. 4,000 ped., J. D. H.

528. Brachymenium *Nepalense*.—HAB. Sikkim-Himalaya temperata; alt. 7,000 ped., J. D. H.

508. Var.?—HAB. Mont. Khasia subtrop., alt. 4,000 ped., J.D.H. et T. T.

506, 526, 548. Brachymenium *brevicaule*, Hmpe.? (C. Müll. i. 323), (or var. of *B. Nepalense?*).—HAB. Mont. Khasia subtrop. et temp., alt. 4–5,000 ped., J. D. H. et T. T.

551. *Id.*—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

524. Brachymenium *Weissia*, Hook.—HAB. Himalaya occid. temp.; Simla, alt. 7.000 ped., T. T.

439. Bryum *lepidum*, Wils. MSS. (*B. cernuo* aff.; *tetraplosporum?*) —HAB. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

451. Bryum *pumilum*, Wils. MSS. (*B. Funkii* simulans, at diversum). —HAB. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

531. *Id.?*—HAB. Tibet occid. temp.; Ladak, alt. 15,000 ped., T. T.

428, 441, 446, 462. Bryum *fulvellum*, Wils. MSS. (*B. cernuo* affin.) —HAB. Sikkim-Himalaya alpina, alt. 12–15,500 ped., J. D. H.

440. Var. seta longiore.—Hab. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 16,000 ped., J. D. H.

502. Var. caule setaque longioribus.—Hab. Sikkim-Himalaya temperata; Lachen, alt. 10–12,000 ped., J. D. H.

449, 467. Bryum *cernuum*, Bryol. Eur., var.—Hab. Tibet occid. alp.; Ladak and Nubra, alt. 16–17,000 ped., T. T.

459. *Id.*—Hab. Tibet occid. temp.; Ladak, Shayuk valley, alt. 11,000 ped., T. T.

445. Var. alt.—Hab. Sikkim-Himalaya alpina; Yeumtong, alt. 12,000 ped., J. D. H.

463. *Id.*—Hab. Nipal orient. alp.; Wallanchoon, alt. 12,000 ped., J. D. H.

444. Bryum *inclinatum*, Bryol. Eur.—Hab. Sikkim-Himalaya temperata; Lachoong, alt. 11–12,000 ped., J. D. H.

440 *b*. *Id.*—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

438. Var.? (peristome as in *B. cernuum*).—Hab. Sikkim-Himalaya alpina; Kongra Lama, alt. 14,000 ped., J. D. H.

496, 495, 525. Pohlia *flexuosa*, Hooker.—Hab. Sikkim-Himalaya temperata, alt. 5–8,000 ped., J. D. H.

498 *b*. *Id.*—Hab. Sikkim-Himalaya temperata; Kursiong, alt. 4,000 ped., J. D. H.

498. Tall, slender form of *Pohlia flexuosa.*—Hab. Sikkim-Himalaya temperata; Kursiong, alt. 4,000 ped., J. D. H.

497. *Id.*—Hab. Sikkim-Himalaya temperata; Lachen, alt. 5,000 ped., J. D. H.

476. Bryum (Pohlia) *speciosum*, Wils. MSS. (*Pohl. flexuosæ*, aff.)—Hab. Nipal orient. temp.; Yalloong Mountains, alt. 10,000 ped., J. D. H.

469. Bryum *polymorphum*, Bryol. Eur., var.—Hab. Sikkim-Himalaya; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

510. Bryum *polymorphum.*—Hab. Nipal orient. temp.; Yangma valley, alt. 9,000 ped., J. D. H.

442. *Id.*—Hab. Sikkim-Himalaya alpina; Tunkra, alt. 14,000 ped., J. D. H.

479. Var. alt.?—Hab. Nipal orient. alp.; Wallanchoon, alt. 13,000 ped., J. D. H.

549 *b*. *Id.*—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

477. Bryum *acuminatum*, Bryol. Eur., var.—HAB. Sikkim-Himalaya temperata; Lachoong, alt. 8,000 ped., J. D. H.

555. *Id.* (smaller form).—HAB. Sikkim-Himalaya temperata, alt. 5–8,000 ped., J. D. H.

474, 475, 544. Bryum *elongatum*, Dicks.—HAB. Sikkim-Himalaya alpina; Yeumtong, alt. 12,000 ped., J. D. H.

494. *Id.*—HAB. Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

549. *Id.*—HAB. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

485, 486, 489, 554. Var.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 11–12,000 ped., J. D. H.

488. (smaller form).—HAB. Sikkim-Himalaya temperata; Lachen, alt. 12,000 ped., J. D. H.

503, 484, 491. Var.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 7–11,000 ped., J. D. H.

472, 504. *Id.*—HAB. Himalaya occid. temp., alt. 7–8,000 ped., T. T.

550. *Id.*—HAB. Nipal orient. temp.; Wallanchoon, alt. 10–12,000 ped., J. D. H.

443. Bryum *rigescens*, Wils. MSS. (*B. acuminato* affin.) — HAB. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

499. Bryum *crudum*, Schreb.—HAB. Sikkim-Himalaya temperata, alt. 10,000 ped., J. D. H.

487. Bryum (Pohlia) *flaccum*, Wils. MSS.—HAB. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

448. Bryum *pyriforme*, Hedw.—HAB. Tibet occid. alp.; Dras, alt. 10,000 ped., T. T.

509, 481, 483. Bryum *delicatulum*, Wils. MSS. (*B. annotino* affin.) —HAB. Sikkim-Himalaya temperata, alt. 7–11,000 ped., J. D. H.

471. Bryum (sterile) (*B. pulchello* affin.).—HAB. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

421. Bryum *Wahlenbergii*, Schwgr. (♂ plant).—HAB. Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

437, 425, 457, 455. Bryum *cæspititium*, Linn.—HAB. Himalaya occid. temp.; Simla, alt. 7–8,000 ped., T. T.

493. *Id.*—HAB. Kashmir temperata, alt. 8,000 ped., T. T.

458, 450. *Id.*—HAB. Tibet occid.; Nubra et Zanskar, alt. 12,000 ped., T. T.

466. Var.—Hab. Himalaya occid. temp.; Kishtwar, alt. 10,000 ped., T. T.

532. *Id.*—Hab. Sikkim-Himalaya alpina; Donkia Pass, alt. 16,000 ped., J. D. H.

431. Bryum *coronatum*, Schwrg., var.—Hab. Ceylon, *Gardner*.

433. *Id.* (vix *B. pachytheca*, C. Müll.)—Hab. Ceylon, *Gardner*.

464. Bryum *filescens*, Wils. MSS. (*B. versicolori* affin.)—Hab. Sikkim-Himalaya temperata; Lachen, alt. 8,000 ped., J. D. H.

180. Bryum *viridans*, Wils. MSS. (*B. argenteo* affin.)—Hab. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

492. Bryum *leucophyllum*, Dz. et Molk. (C. Müll. i. 315)? vel sp. affin.—Hab. Sikkim-Himalaya temperata; Chongtam, alt. 6,000 ped., J. D. H.

517, 538, 541, 546. Bryum *argenteum*, Linn.—Hab. Nipal orient. temp. et subalp., alt. 9–13,000 ped., J. D. H.

552. *Id.*—Hab. Himalaya occid. temp.; Simla, T. T.

542. Var.—Hab. Sikkim-Himalaya, J. D. H.

470, 516, 537, 543. Bryum *argenteum*.—Hab. Sikkim-Himalaya temperata, alt. 7–12,000 ped., J. D. H.

(*To be continued.*)

Florula Hongkongensis: *an Enumeration of the Plants collected in the* Island of Hongkong, *by* Major J. G. Champion, 95*th Regt.*; *the determinations revised and the new species described by* George Bentham, Esq.

(*Continued from* vol. vii. p. 39.)

The Filices;* *by* Sir W. J. Hooker.

POLYPODIACEÆ.

Gleicheniеæ.

1. Gleichenia *dichotoma*, Willd.—*Hook. Gen. et Sp. Fil.* i. *p.* 12. Polypodium dichotomum, *Thunb. Fl. Jap. p.* 338. *t.* 37.

* This list of Hongkong Ferns includes others collected by different travellers in China and Japan, which have recently come under the Author's notice. The arrangement and the genera here adopted are mainly those of Presl, in his 'Tentamen Pteridographiæ,' by far the most satisfactory of all that author's writings on Ferns.

HAB. China, *Beechey, etc.* Hongkong, *Major Champion, n.* 549. Chusan, *Mr. Alexander*. South China, *Seemann.*

2. Gleichenia *excelsa*, J. Sm.—*Hook. Gen. et Sp. Fil.* i. *p.* 12. *t.* 4 *B.*

HAB. South China, *Seemann, n.* 2389. Foo-chow-foo, *Mr. Alexander.*

These specimens have the fronds very glaucous beneath, the rachis very smooth and glossy, bright pale orange-brown.

1. Alsophila *podophylla;* frondibus bi-tri-(quadri?)-pinnatis glabris, pinnulis 4–5-pollicaribus petiolulatis oblongo-lanceolatis coriaceo-membranaceis tenui-acuminatis sinuato-dentatis basi truncatis apice argute serratis, terminali majore pinnatifido-lobato, venis pinnatis plerumque liberis, soris copiosis sparsis globosis, capsulis compactis.

HAB. Chusan, *Mr. T. Alexander*. Hongkong, *J. C. Bowring, Esq.*, *Dr. Harland.*

A very distinct and well-marked species; its nearest ally probably is *A. gigantea*, Wall.—*Caudex* 4–8 feet high. *Fronds* 8–9 feet long. *Stipes* and main *rachises* dark-purple, glossy, rough with small raised points, not muricated. *Pinnules* large, from 4–5 inches long, 5 lines broad, tapering much at the point, and there serrated, the margins obscurely sinuato-dentate, the base truncated, not at all contracted. The lateral *veins* are in fascicles, pinnated, the *veinlets* usually free, but sometimes the lowest pair or more, meet the veinlets of the adjacent fascicle. *Sori* rather small, globose, scattered.—It would probably be a *Gymnosphæra* of Blume, and may possibly be his *G. glabra*, "fronde pinnata, pinnulis lanceolatis apice argute serratis basi truncatis leviter pinnatifidis glabris, laciniis rotundato-obtusis crenulatis," *En. Fil. Jav. p.* 242.

DICKSONIEÆ.

1. Cibotium *glaucescens*, Kunze in Schk. Fil. Suppl. p. 63. t. 31.—*Hook. Gen. et Sp. Fil.* i. *p.* 82.

HAB. Hongkong, *Major Champion, n.* 563 *and* 293, *J. C. Bowring, n.* 34, *Dr. Harland.* Chusan, *Mr. T. Alexander*. South China, *Seemann, n.* 2387.

1. Trichomanes *parvulum*, Poir.—*Hook. Gen. et Sp. Fil. p.* 118. *t.* 39 *A.*

HAB. Among Moss in the cleft of a granite rock, near Bullock Bay, *Mr. T. Alexander.*

DAVALLIEÆ.

1. Davallia (§ Humata) *pedata*, Sw.—*Hook. Gen. et Sp. Fil.* i. *p.* 154. *t.* 45 *A.*

HAB. Hongkong, *Dr. Dill*, *J. C. Bowman, Esq.*, *n.* 41.

2. Davallia (§ Eudavallia) *elegans*, Sw.—*Hook. Gen. et Sp. Fil.* i. *p.* 164. D. bidentata, *Schk. Fil. t.* 127.—*Var.* coniifolia, *Hook. Gen. et Sp. Fil.* i. *p.* 165. *t.* 43 *B.*

HAB. α. Canton, *Swartz.* γ. Hongkong, *Major Champion.*

3. Davallia (§ Eudavallia) *Griffithiana*, Hook. Gen. et Sp. Fil. i. p. 168. t. 49 *B.*

HAB. On granite rocks in woods, Chusan. Tung-tam, *Mr. T. Alexander.*

We noticed the "pale-coloured, shaggy, fimbriato-pilose scales on the long stout caudex of this species, in the 'Genera et Species Filicum;'" and Mr. Alexander observes, "at first sight the silvery creeping stems appear like a number of coiled-up white snakes."

4. Davallia (§ Saccoloma) *villosa*, Wall.—*Hook. Gen. et Sp. Fil.* i. *p.* 172. *t.* 48 *A.*

HAB. Sam-sa Bay, *Mr. T. Alexander;* and at Foo-chow-foo, *id.*

5. Davallia (§ Saccoloma) *calvescens*, Wall.—*Hook. Gen. et Sp. Fil.* i. *p.* 172. *t.* 48 *B.*

HAB. Sam-sa Bay, *Mr. T. Alexander.*

6. Davallia (§ Saccoloma) *Khasiyana*, Hook. Gen. et Sp. Fil. i. p. 173. —*β. Hook. Gen. et Sp. Fil. l. c. t.* 57 *A.* • Microlepia cristata, *J. Sm. En. Fil. Philipp.* (*name only*).

HAB. *β.* Foo-chow-foo, *Mr. T. Alexander.*

7. Davallia (§ Microlepia) *polypodioides*, Don.—*Hook. Gen. et Sp. Fil.* i. *p.* 181.

HAB. China, *Beechey.* Chusan, *Mr. T. Alexander.* Hongkong, *J. C. Bowman, Esq.*

8. Davallia (§ Cuneata) *tenuifolia*, Sw.—*Hook. Gen. et. Sp Fil.* i. *p.* 186. *β.* Segments broader.

HAB. *a* and *β.* China, *Beechey.* *a.* Foo-chow-foo and Chusan. *Mr. T. Alexander.* Hongkong, *Major Champion*, *n.* 558. South China, *Seemann*, *n.* 2385.

9. Davallia (§ Cuneata) *Chinensis*, Sw.—*Hook. Gen. et Sp. Fil.* i. *p.* 187.—*Langsd. et Fisch. Fil. p.* 23. *t.* 27.

HAB. Cliffs at Koo-long-loo, upon the coast, *Mr. Alexander.*

LINDSÆEÆ.

1. Lindsæa (§ Eulindsæa) *flabellulata*, Dry. in Linn. Trans. iii. p. 41. t. 8. f. 2.—*Hook. Gen. et Sp. Fil.* i. *p.* 211.

HAB. China, *Sir G. Staunton, D. Nelson, Beechey.* Chusan, and shaded rocks at Koo-lung-loo Island, *Mr. T. Alexander.*

2. Lindsæa (§ Schizoloma) *heterophylla*, Dry. in Trans. of Linn. Soc. iii. p. 41. t. 8. f. 1.—*Hook. Gen. et Sp. Fil.* i. *p.* 223. L. variabilis, *Hook. et Arn. Bot. Beech. Voy. p.* 257. *t.* 52.

HAB. γ. Loo-choo, *Beechey.* Hongkong, *Major Champion, Dr. Harland.*

Veins not unfrequently anastomosing.

3. Lindsæa (§ Schizoloma) *ensifolia*, Sw.—*Hook. Gen. et Sp. Fil.* i. *p.* 220.—*Hook. et Grev. Ic. Fil. t.* 3. *β.* Pinnules very long, attenuated.

HAB. Hongkong, *Gardner.* *β.* Hongkong, *Dr. Dill.*

PTERIDEÆ.

1. Adiantum *flabellulatum*, Linn.—*Hook. Gen. et Sp. Fil.* ii. *p.* 30. A. amœnum, *Wall.*—*Hook. et Grev. Ic. Fil. t.* 103.

HAB. China, *Osbeck, Beechey.* Oman, *Vachell.* Hongkong, *Major Champion, n.* 557, *J. C. Bowring, Esq., n.* 19. Chusan and Foo-chow-foo, *Mr. T. Alexander.* South China, *Seemann, n.* 2393.

This appears to be an extremely common species in various parts of China.

2. Adiantum *caudatum*, Linn.—*Hook. Gen. et Sp. Fil.* ii. *p.* 14.

HAB. China, *Beechey, Millett.* Chusan, *Mr. T. Alexander.* Hongkong, *J. C. Bowman, Esq., n.* 13.

3. Adiantum *lunulatum*, Burm.—*Sw. Syn. Fil. p.* 121.—*Hook. et Grev. Ic. Fil. t.* 104.

HAB. Hongkong, *Dr. Harland.*

1. Cheilanthes *tenuifolia*, Sw.—*Hook. Gen. et Sp. Fil.* ii. *p.* 82. *t.* 87 *C.*

HAB. China (*Swartz*), *Beechey.* Hongkong, *Major Champion, n.* 556.

1. Onychium *lucidum*, Spreng.—*Hook. Gen. et Sp. Fil.* ii. *p.* 121.—*Hook. Gen. Fil. t.* 11. O. Japonicum, *Kze. Schk. Fil. Suppl. p.* 11. Trichomanes Japonicum, *Thunb. Fl. Jap. p.* 340.

Hab. Chusan, *Mr. Braine.* Along the coast of China; common. *Mr. T. Alexander.* Nangasaki, Japan, *Dr. Babington.*

We had already, in 'Gen. et Sp. Fil.,' intimated that this imperfectly-described plant of Thunberg, l. c., was identical with *Cheilanthes* (Onychium) *lucida,* of Dr. Wallich, and now we find specimens in Dr. Harland's herbarium, gathered at Nangasaki by Mr. Babington.

1. Pteris *semipinnata,* Linn.—*Osb. It. p.* 232, *t.* 3. *f.* 1. Pt. dimidiata, *Willd.* Pt. flabellata, *Schkuhr, Fil. p.* 86. *t.* 93.

Hab. China, *Osbeck.* Foo-chow-foo, Koo-lung-loo Island, at the foot of a dark granite rock, and Chusan, *Mr. T. Alexander.* Nangasaki, Japan, *Miss Nelson, Mr. Babington.*

2. Pteris *crenata,* Sw. Syn. Fil. p. 96 et 290.—*Hook. Gen. et Sp. Fil.* ii. *p.* 163. *t.* 127 *A.*

Hab. Hongkong, *J. C. Bowring, Esq., n.* 7.

3. Pteris *serrulata,* Linn.—*Schkuhr, Fil. p.* 83. *t.* 91.—*Willd. Sp. Pl.* v. *p.* 373.

Hab. China, *Swartz.* On stone walls, Koo-lung-loo Island, and Chusan, *Mr. T. Alexander.* Hongkong, *Major Champion, n.* 292, *Mr. Braine.* Nangasaki, Japan, *Mr. Babington.*

4. Pteris *longifolia,* Linn.—*Schkuhr, Fil. p.* 84. *t.* 88.—*Willd. Sp. Pl.* v. *p.* 369. Pt. costata, *Bory et Willd.*—*Hook. et Arn. Bot. Beech. Voy. p.* 256. *t.* 51.

Hab. Chusan, *Mr. T. Alexander.* Hongkong, *J. C. Bowring, Esq., n.* 3.

5. Pteris *aquilina,* Linn.—*Schkuhr, Fil. p.* 87. *t.* 95. Pt. esculenta, *Hook. et Arn. Bot. Beech. Voy. p.* 257; *an Sw.?*

Hab. China, *Beechey.* South China, *Seemann, n.* 2390. Chusan, *Mr. T. Alexander.* Hongkong, *Major Champion, n.* 548.

Whatever the *Pt. esculenta* of Swartz may be, whether a mere variety of *aquilina* or a distinct species, our Chinese specimens quite agree with the ordinary form of *Pt. aquilina.*

6. Pteris (Campteria) *nemoralis,* Willd. Sp. Pl. v. p. 386.

Hab. South China, *Seemann, n.* 2384. Chusan, *Mr. T. Alexander.* Hongkong, *Major Champion, n.* 955.

Aspidieæ.

1. Lastrea *falciloba,* n. sp.; fronde ampla sesquipedali ovato-lanceolata acuminata rigida pinnata, pinnis numerosis subdistantibus lineari-lan-

ceolatis sessilibus acuminatis profunde fere ad costam pinnatifidis apice serratis, laciniis oblongo-linearibus subfalcatis acutis margine (siccitate) revoluto, lacinia superiore ad basin reliquis longiore angustiore rachi parallela, soris biserialibus, indusiis parvis glabris, stipite rachi costisque subtus villosis.

HAB. Ravines, mainland, opposite Hongkong, at an elevation of 1,500 to 2,000 feet, especially near Sung-tong, *J. C. Bowring, Esq.*, *n.* 33.

Habit somewhat of *Lastrea pennigera*, but very different in character, and I can nowhere find any description that will correspond with it. It is however identical with specimens in my herbarium, gathered in Eastern Bengal by Griffith, Lobb, and Simons, but from no other part of India. It is remarkable for the deep divisions of the pinnæ extending almost to the costa, and for their falcate form and acute apex; the superior segment at the base is longer and narrower than the rest, and is parallel with the rachis.

2. Lastrea *ciliata;* fronde oblonga subpedali acuminata subrigido-membranacea subtus pilosa margine ciliata pinnata, pinnis approximatis sessilibus acuminatis basi truncatis pinnatifidis superioribus confluentibus, laciniis falcato-oblongis obtusis integerrimis, soris biseriatis distinctis, indusio stipite rachibus costisque pinnarum copiose villosis.—Aspidium ciliatum, *Wall. Cat. n.* 351.

HAB. Common in ravines, Hongkong, *J. C. Bowman, Esq.*, *n.* 25, *Dr. Hill.*

These specimens entirely agree with the *Aspidium ciliatum* of Wallich.—*Frond* ten inches to a foot or rather more long. The *pinnæ* are cut about halfway down to the costa into lobes. *Stipites* 4–6 inches long, cæspitose. *Roots* tufted, numerous, wiry, and very tortuous from a descending caudex.

3. Lastrea *gracilescens*, Bl. En. Fil. Jav. p. 155.

HAB. Shaded hedges, Tung-lan, *Mr. T. Alexander.* Hongkong, *J. C. Bowring, Esq.*, *n.* 22, *Dr. Harland.*

A small plant, a span to ten inches high, including the slender stipes. Habit somewhat of *L. Thelypteris*, approaching some young forms of *L. mollis* and of *L. ciliata.* With the aid of more copious specimens it might be shown to pass into some better known species. Blume's brief character accords sufficiently well, except that the indusia are not always glabrous.

4. Lastrea *podophylla*, Hook. Journ. Bot. v. (1853) p. 236. t. 1.—Aspidium Sieboldi, *Metten. Fil. Hort. Lips. p.* 87. *t.* 20. *f.* 1–4.

HAB. Hongkong, *Major Champion*, *n.* 560, *J. C. Bowring, Esq.*, *n.* 14. Chusan and Foo-chow-foo, *Mr. Alexander.*

Veins sometimes confluent. If the *Aspidium Sieboldi* (from Japan) of Mettenius, who has given an excellent description in the work above quoted, be specifically the same as our *Lastrea podophylla*, it is a remarkable variety, with broader pinnæ, more cordate at the base.

5. Lastrea *opaca*, n. sp.; frondibus subcoriaceis deltoideo-acuminatis opacis glabris pinnatis basi tripinnatis, pinnis lanceolatis acuminatis profunde pinnatifidis subiterim pinnatis, laciniis oblongis subfalcatis obsoletissime serratis acutiusculis, pinnarum inferiorum pinnulis infimis longioribus, soris uniserialibus inter costam et marginem, venis immersis obsoletis, stipite rachibusque pallide fuscis nitidis paleaceo-setosis.

HAB. Hongkong and mainland north-west of Hongkong, *J. C. Bowman, Esq.* China, *Dr. Abel.* Chusan, Tung-tan, Foo-chow-foo, *Mr. T. Alexander.* Nangasaki, Japan, *Mr. Babington.*

This Fern appears to be an entirely undescribed one, with somewhat of the habit of *Polystichum coriaceum*, for the fronds are more than usually coriaceous for a *Lastrea*, yet not glossy, as in so many of the *Polysticha.* They are a foot to a foot and a half long; the stipes in all my specimens is broken, but what remains of it and the rachises are clothed with subulate, appressed, membranaceous scales. The sori are moderately large; the involucre reddish-brown, reniform.

1. Nephrolepis *tuberosa*, Presl.—Aspidium tuberosum, *Willd. Sp. Pl.* v. *p.* 234.

HAB. South China, *Seemann*, *n.* 2388. Chusan, and everywhere along the coast, *Mr. T. Alexander.* Hongkong, *Major Champion*, *n.* 550.

Such of our Chinese specimens as have the roots and the stolones, bear tubers; but the fronds seem to differ in nothing from the South American *N. exaltata.*

1. Polystichum *vestitum?* Aspidium vestitum, *Schkuhr, Fil. t.* 43.

HAB. Hongkong, *Major Champion*, *n.* 297.

This plant is too young to determine accurately. The young involucres, though peltate, are not orbicular, but have a sinus on one side, so as to be orbiculari-reniform.

2. Polystichum *aristatum*, Presl. Aspidium aristatum, *Sw.—Schkuhr, Fil. p.* 44. *t.* 42.

HAB. Hoo-lung-loo Island, Sam-sa Bay, and Foo-chow-foo, *Mr. T. Alexander*. Hongkong, *J. C. Bowring, n.* 9. Nangasaki, Japan (*Miss Nelson*), *Mr. Babington.*

3. Polystichum *drepanum*, Pr. Aspidium drepanum, *Schkuhr, Fil. t.* 51.

HAB. Lung-tong, mainland, north-west from Hongkong, *J. C. Bowring, Esq., n.* 28.

1. Nephrodium *unitum*, Schott. Aspidium unitum, *Sw.—Schkuhr, Crypt. p.* 34. *t.* 33 *b.*

HAB. Hongkong, *Dr. Dill, J. C. Bowring, Esq., n.* 16.

2. Nephrodium *molle*, Schott. Aspidium, *Sw.—Schkuhr, Fil. p.* 3. *t.* 34 *B.* Polypodium molle, *Jacq. Ic. Rar.* iii. *t.* 640.

HAB. China, *Beechey*. Foo-chow-foo, Chusan, Tung-lan, and Sam-la Bay, *Mr. Alexander*. Hongkong, *Major Champion, n.* 554, *J. C. Bowring, Esq., n.* 1.

This universally dispersed species, in all tropical climates, is very variable in the amount of pubescence, in the size and relative length and breadth and divisions of the pinnæ, and in the disposition of the sori: in the broader pinnæ confined to the centre, not forming intramarginal lines around the lobes: this we have alluded to in the 'Botany of Beechey's Voyage' (p. 236), and suggested that it might be a distinct species.

3. Nephrodium *parasiticum?* Pr. Aspidium, *Sw.; Bl.* Polypodium, *L.*

HAB. Japan, Nangasaki (*Miss Nelson*), *Mr. Babington.*

This plant quite accords with the description of Willdenow and Blume:—the latter rejects the figure of Rheede, which Willdenow quotes as a synonym (*Hort. Mal.* 12. *t.* 17).

1. Cyrtomium *falcatum*, Presl. Polypodium falcatum, *Thunb. Fl. Jap. p.* 336. *t.* 36.

HAB. Loo-choo, *Beechey*. On the walls of Woosung; and Peh-quan, near an old Joss-house, *Mr. Alexander*. Nangasaki, Japan, *Mr. Babington.*

A perfect stipes of this fine plant (of which we have specimens three feet long) exhibits very large, almost ovate, brown, membranaceous scales at the base.

1. Aspidium (Bathmium) *trifoliatum*, Sw.—*Schkuhr, Fil. p.* 29. *t.* 28.

Polypodium trifoliatum, *Jacq. Ic. Rar.* iii. *t.* 638. Aspidium irriguum, *J. Sm.—Hook. Journ. of Bot.* iii. *p.* 410, *name only.*

Hab. Moist thickets, Sam-la Bay, and Foo-chow-foo, *Mr. T. Alexander.* Hongkong, *Major Champion, n.* 553, *Dr. Dill, J. C. Bowring, Esq., n.* 20.

This Fern has hitherto been considered to be peculiar to the New World: and hence perhaps Mr. J. Smith was led to consider some imperfect samples, in Mr. Cuming's collection, as a new species. Our specimens quite accord with Schkuhr's figure, while others, the more perfect ones, have five pinnæ, as represented in Jacquin's excellent figure.—Presl's *Asp. cordifolium* (Epimel. p. 63), an Indian species, seems to accord with this, and he is disposed to consider the *Aspid. varium* of Willdenow (from China) as the same; if so, Willdenow's description is very unsatisfactory.

Blechneæ.

1. Woodwardia *Japonica*, Sw. Blechnum Japonicum, *Thunb. Fl. Jap. p.* 333. *t.* 35. W. prolifera, *Hook. et Arn. Bot. of Beech. Voy. p.* 275. *t.* 56 (*not* 57, *as in the text*). W. orientalis, *Sw. Syn. Fil. p.* 117 *and* 315.

Hab. China, near Sung-long, mainland, north-west from Hongkong, *J. C. Bowman, Esq., n.* 29, *Dr. Harland.* Loo-choo, *Beechey.* Lung-lang Bay, and Pih-quan, by the side of a stream, and Chusan, Foo-chow-foo, *Mr. T. Alexander.*

We had, in the 'Botany of Beechey's Voyage,' doubtfully referred Swartz's *W. orientalis* (from Japan) to the present species, and there are specimens in the present collections which confirm the view of their being identical.

2. Woodwardia *Harlandii*, Hook.; fronde simplici vel tripartita plerumque pinnatifida basi subpinnata, laciniis paucis 5–7 lanceolato-elongatis acuminatis integris marginibus parte sterili præcipue serrulatis, soris costalibus continuis oblongis nunc confluentibus, stipite elongato, caudice repente squamoso.—*Hook. Exotic Ferns,* i. *t.* 7.

Hab. Hongkong, *Dr. Harland.*

A very distinct species, which is fully described in the work just quoted.

1. Blechnum *orientale*, Linn.—*Swartz, Syn. Fil. p.* 114.—*Schkuhr, Fil. p.* 101. *t.* 109.

HAB. China (*Swartz*). South China, *Seemann, n.* 2391. Hongkong, *Major Champion, n.* 551.

Our larger specimens, from Dr. Seemann, correspond with the var. β of Willdenow (*B. longifolium*, Cav.). Chusan, *Mr. T. Alexander*.

ASPLENIEÆ.

1. Asplenium (§ Thamnopteris) *Nidus*, Linn.—*Hook. Bot. Mag. t.* 3101.

HAB. South China, *Seemann, n.* 2381. Chusan, *Mr. T. Alexander*.

2. Asplenium *lanceum*, Th.; fronde lanceolata submembranacea acuminata rigida integerrima, fasciculorum venarum ramis 2–3 rarius 4 uno solummodo sorifero, soris solitariis nunc geminatis diplazioideis, stipite gracili caudiceque longe repente paleis nigris crinitis.—*Thunb. Fl. Jap. p.* 333.—*Ic. Pl. Jap. Dec.* 2. *t.* 18.—*Sw. Syn. Fil. p.* 74. Diplazium lanceum, *Presl, Epimel. p.* 83 (*in part*). Asplenium subsinuatum, *Hook. et Grev. Ic. Fil. t.* 27.

HAB. Chusan; moist places on the side of the mountain Tung-lan, *Mr. T. Alexander*. Hongkong, *J. C. Bowring, Esq., n.* 2.

3. Asplenium *oxyphyllum*, J. Sm. in Hook. Journ. Bot. iii. p. 408.—*Cum. Herb. Philip. n.* 42. Asplenium *falcatum*, Sw.—*Rheede, Hort. Malab.* xii. *t.* 18.

HAB. Hongkong, *J. C. Bowring, Esq., n.* 35.

4. Asplenium *cuneatum*, Sw.—*Schkuhr, Fil. t.* 78.

HAB. Happy Valley, Hongkong, *J. C. Bowring, Esq.* Chusan, *Mr. Alexander*.

5. Asplenium *lanceolatum?* Huds.—*Sm. Engl. Bot. t.* 240. Var. *elegans;* minus, tenerius, stipite gracili.

HAB. Chusan, *Mr. Alexander*. Nangasaki, Japan (*Miss Nelson*), *Mr. Babington*.

It certainly is not without considerable hesitation that I refer this Japanese Fern to a species which was long considered almost peculiar to certain districts of England, and now its range is not known to extend beyond (chiefly south-) western Europe and Madeira. But after the most careful examination, I can find it to differ in no essential particular, save in the smaller size, more delicate and membranaceous texture, and always slender stipes. Future investigations may prove it to be a peculiar species; but it would be difficult to define the differences in words.

6. Asplenium (Darea) *davallioides;* parvum cæspitosum, frondibus ovatis acuminatis subcoriaceis subtripinnatis glabris, pinnis primariis secundariisque ovatis acuminatis, tertiariis bi-trifidis laciniis lineari-oblongis patenti-recurvis acutis soriferis, soris totum fere marginem superiorem occupantibus, stipite rachibusque compressis alatis et lineatis.

Hab. Nangasaki, Japan (*Miss Nelson*), *Mr. Babington.* Hongkong, *Dr. Dill.*

Specimen young, and not fully developed. This is one of those Davallioid *Asplenia,* which unites the two genera, *Davallia* and *Asplenium* (§ *Darea*); having however in the present instance quite the habit or aspect of the Dareoid group of *Davallia,* but the indusium, that of an *Asplenium,* elongated and running parallel with the margin, is not in the least cup-shaped, nor attached at the two extremities. The stipes and the rachises are so broad and so much compressed, and so much of the texture of the frond, that it is difficult to say whether the term pinnate or pinnatifid should be applied to the divisions. Stipes 3–4 inches long; frond about the same length, the ultimate segments all recurved (falcately), which is a striking character in this species.

1. Diplazium *elegans,* Hook. Ic. Fil. t. 939, 940.

Hab. Hongkong, *J. C. Bowring, Esq., n.* 10, *Mr. Alexander.*

This fine species is quite new to China.

2. Diplazium (Digrammaria) *ambiguum,* Hook. Gen. Fil. t. 56 *C.*—Asplenium ambiguum, *Schkuhr, Fil. t.* 75 *B* (*not* 75). Microstegia ambigua, *Presl, Epimel. Plant. p.* 91.

Hab. Little Hongkong, *J. C. Bowring, Esq., n.* 4.

Veins confluent, as in *Nephrodium* in *Aspidieæ.*

3. Diplazium *sylvaticum,* Sw. Anisogonium sylvaticum, *Hook. Gen. Fil. t.* 56 *B.* (*not Presl*).—*Schkuhr, Fil. t.* 85 *B.*

Hab. Top of ravine above Glenealy, Hongkong, *J. C. Bowring, Esq., n.* 17. Sam-la Bay, China, *Mr. Alexander.*

I refrain from quoting many synonyms, for no one can consult the different views of botanists upon the species of the old genus *Diplazium* (itself a very dubious genus), without seeing that it is in the utmost state of confusion. *Asplenium diversifolium,* Wall., may probably with safety be referred to this. Both are alike in habit, and both have the veins free, and as represented at our t. 56 *B* of 'Genera Filicum.'

4. Diplazium (potius Asplenium) *Schkuhrii*, J. Sm. in Hook. Journ. Bot. iii. p. 407. Asplenium ambiguum, *Schkuhr, Fil. p.* 69. *t.* 75 (*not* t. 75 *B*, and *not Sw.*). Diplazium Malaccense, *Presl, Epimel. Bot. p.* 86.

HAB. Koo-long-loo Island and Tung-lan, *Mr. Alexander.* Lung-tong, mainland, fifteen miles north-west of Victoria, Hongkong; elevation of about 200 feet, *J. C. Bowring, Esq.*, *n.* 27, *Mr. Braine.*

This appears entirely to agree with one of the figures of Schkuhr's *Asplenium ambiguum*, and which Mr. J. Smith has called *D. Schkuhrii.* It seems identical with Cuming's n. 389 and 390, from Malacca, which is *D. Malaccense* of Presl.

(*To be continued.*)

BOTANICAL INFORMATION.

Mr. Charles Wright's Cuba Plants.

Those interested in West Indian Botany will be glad to be informed of the safety of Mr. Charles Wright, who has returned to Boston, United States of America, with his well-prepared collections of plants from the less-frequented and mountainous parts of Cuba, of which however only 12 sets are to be disposed of, varying, we believe, from 500 to 900 species, including an excellent series of Ferns, but exclusive of the Mosses and lower Crypts, which are to be separately issued after naming. They will be distributed with numbers, be named by Dr. Grisebach, and offered at, we believe, the usual rate of well-selected collections—about £2 the 100 species. The *Ferns* and even the succulent *Piperaceæ* are beautifully prepared.

MR. CHAS. WRIGHT *on Drying* PLANTS *for the* HERBARIUM.

A botanical voyager and traveller, whose explorations have extended over a large portion of the new United States' territories (New Mexico, Texas, California) into Japan, etc., and more recently into the mountain districts of Cuba, Mr. Charles Wright, whose experience consequently entitles him to attention, and whose specimens confirm the excellence of his practice, suggests improvements in the ordinary method practised by the English botanists in drying plants for the herbarium.

He writes, in a letter from Santa Catalina de Guarsa (Cuba), May, 1857:—

"Allow me to suggest that you alter your directions* for collecting plants in one particular, and substitute for the tin box or vasculum, one or two portfolios that will hold each four to six quires of thin, firm paper. I have tried both methods, and, without wishing to arrogate to myself superior knowledge or skill, I am perfectly satisfied that one who collects with portfolios can do more and better work by one-third than he who collects with a tin box. Any person who collects a large-flowered *Convolvulus* in a tin box, and who succeeds in making even a tolerable specimen of the flower, has a greater stock of patience than I can boast of. In another particular I think your directions capable of improvement. Instead of pressing my specimens on the outside of the sheets of paper, I put my specimens *within* a sheet of paper, one or two, if large, and many, if small, and *never move them from within that sheet till they are dry*. Thus then there is no risk of breakage, which will inevitably happen in some cases during the process of drying, if they are removed from one paper to another, especially such as are resinous or milky. I have also used during the past winter a very thin paper of small size for the collection of Mosses, *Hepaticæ*, and other very small or delicate plants, and have found it very convenient. I could thus keep perfectly distinct twenty or thirty species of these little plants, besides gathering four or five quires-full of larger plants in a day's excursion; I cannot imagine how I could have done it with a vasculum. I carry, in my portfolio, a piece of thin India-rubber cloth for its protection in case of rain.

"I also employ a peculiar method for making handsome specimens of such succulent plants as *Portulacaceæ*, *Piperaceæ*, Orchids, etc., though it may be no new thing to others. As soon as possible after such plants are collected, I pass over them a hot flat-iron, thus partially scalding them; they then dry rapidly; the parts adhere together as well as any plants, and they preserve almost entirely their colour; some do so perfectly. I would advise a collector, especially one going to tropical countries, to provide himself for this object with a plate of copper half an inch thick, of convenient size, round, or square, or oblong. I would prefer copper, because it retains its heat much longer

* This alludes to "Directions" printed and circulated by the Royal Gardens of Kew, for the use of travellers and those herborizing in distant countries.

than iron, and does not rust. I imagine this method might be successfully employed in drying Agarics."

Mission of Dr. *and* Professor De Vriese *to* Dutch East India.

We announce, with much satisfaction, that His Majesty the King of Holland and the Dutch Government are alive to the great importance of promoting the culture of useful and economic plants in their fertile possessions of Java and the Malay Archipelago; and that Dr. and Professor De Vriese, so well known by his botanical writings, especially those bearing on the Netherlands India, has been appointed to conduct a Mission into that region, accompanied by an accomplished chemist, Dr. De Vry. These gentlemen embarked at Marseilles in the Peninsular and Oriental Company's mail steamer of the 20th October (from Southampton). Besides the object of cultivating exotic productions suited to the soil and climate at different elevations, Dr. De Vriese is further charged with researches after plants, natives of the islands, which are in any way useful in the arts, to trade and commerce; such as Caoutchoucs, Gutta-perchas, Gums, Resins, dye-stuffs, fabrics, etc.; and to encourage the collecting and bringing into the market the best kinds and those prepared in the best manner; for it is well known how much inferior and even adulterated kinds are sold for genuine. Spurious Gutta-perchas are mixed with the true kinds, and the more so now that the original article is become almost extinct in Singapore, in consequence of the wasteful management of the natives. A very inferior kind has been imported from Borneo; and from specimens of the tree of that country, now before us, it certainly is not identical with the true species, *Isonandra Gutta*, Hook. Dr. De Vriese has however received the true plant, and has, as well as Dr. Miquel, communicated samples of it to us, from Sumatra, where in all probability it abounds, and will be turned to very profitable account.

Other European Governments would do well to follow the example of Holland, and make like researches on scientific bases in their respective colonies.

Dr. De Vriese will, *en route*, spend a fortnight in Ceylon, and profit by the studying the best modes of cultivation so long practised in that island, and by the scientific knowledge which Mr. Thwaites has brought to bear on the useful plants indigenous or introduced there.

NOTICES OF BOOKS.

MONOGRAPHIE DE LA FAMILLE DES URTICÉES; *par* H. A. WEDDELL, D.M.P., Aide de Botanique au Muséum d'Histoire Naturelle de Paris. Accompagné de 20 Planches dessinées par l'Auteur. (Archives du Muséum, tom. ix. livr. 1–4.)

This beautiful work, of which the first part appeared in 1856, is now brought to a close; and we have to congratulate the learned and indefatigable author on the successful execution of a very difficult and laborious piece of monography. It is an excellent and conscientiously worked-out example of descriptive botany, which is of itself enough to place Dr. Weddell high in the rank of systematic botanists, and, when taken in conjunction with his other labours, and especially his magnificent 'History of Cinchonas,' and 'Flora of the Higher Andes' (also rapidly advancing), we may safely assert that there are few men of his age who have done so much and such good service to science in so short a period of time.

The monograph is confined to the *Urticeæ* proper, that is, to the orthotropous-ovuled genera of the great class including *Moreæ*, *Ulmaceæ*, *Cannabineæ*, *Artocarpeæ*, and *Urticeæ*. It occupies nearly 600 quarto pages (of large type however), treats of about 470 species, 40 genera, and nearly 1500 names and synonyms! and is illustrated with 20 plates, well drawn by the author, and beautifully engraved, containing analyses of nearly 100 species.

The preparing this work has cost its author great labour, for he has conscientiously availed himself of every opportunity of inspecting original materials, and has studied in many important European herbaria, besides being himself attached to that of the Jardin des Plantes. The results have therefore a double interest: one purely botanical, in relation to the actual extent, characters, distribution, etc. of the Order described, the other as an index of the state of Descriptive Botany in Europe; and upon both of these subjects we shall offer a few remarks.

A good *résumé* of the organs of the *Urticeæ*, their mode of development, and the anatomy of their trunks, etc., prefaces the descriptive part, and beautiful dissections are added of the tissues of *Laportea gigas*, the giant arborescent Nettle of New South Wales. The hairs, stings, and raphides are fully described, as are the *cystoliths*, as the

curious concretions of carbonate of lime are called which are formed in the cells of the epidermis, etc., and are suspended by pedicels of cellulose, and which abound in the Order. The foliage, stipulation, inflorescence, and organs of reproduction follow.

Under the head of Affinities, Dr. Weddell arrives at the conclusion that *Urticeæ* are undoubtedly most closely related to *Tiliaceæ*, which latter, he says, differ remarkably by the following characters only, viz. the non-persistent calyx, and the stamens always double the number of sepals or more. This result may be arrived at indirectly thus—*Tiliaceæ*, *Malvaceæ*, *Euphorbiaceæ*, *Antidesmeæ*, *Celtideæ*, *Ulmaceæ*, *Urticeæ*, as will perhaps be generally admitted by systematists; but the direct passage of *Tiliaceæ* to *Urticeæ* appears paradoxical, at least at first sight.

The subject of Geographical Distribution occupies another section, and its results are well tabulated at the end of the work. From this it appears that only 8 species are common to the Old and New Worlds; that 289 are natives of the former, and 187 of the latter; that the Malayan Peninsula and Archipelago present the greatest assemblage of species, India an equal number, and Mexico and the West Indies about the same, these countries together possessing almost two-thirds of the known species. In the next rank come Madagascar and the proximate African Islands, Peru and Bolivia, New Granada and Ecuador; the other regions fall far below these. Their relatively greater abundance in the islands than in the continents is indicated, and suggests the hypothesis of a double focus of radiation in distribution, one in the Indian Archipelago, the other in the West Indies. Under Properties and Uses we find it stated that "urtication," or blistering with Nettles, is still employed, where sudden irritation is required, both by civilized people and still more by savages. Amongst the most important species, as yielding fibre, are *Urtica dioica*, *cannabina*, *parviflora*, and *Laportea Canadensis*, *Girardinia heterophylla*, *Pipturus propinquus*, *Maoutia Puya*, and, above all, the *Bœhmeria nivea*. The leaves of the common Nettle have also been used for polishing mirrors; no doubt, Dr. Weddell remarks, because of the presence of the cystoliths, to which concretions may also possibly be attributed, he thinks, the real or supposed medicinal qualities of the Nettle and Pellitory.

In the descriptive part the tribes, genera, and species are all fully and carefully described in good and clear botanical language; a conspectus of the tribes prefaces the descriptions of them, and the same of the genera; the specific characters are of reasonable length, and longer

descriptions, with very often observations on the chief peculiarities or comparative characters of the species, follow. The localities are selected and arranged with great care and judgment, are quite full enough, and not overloaded with names of collectors or of localities; they are, in short, always sufficiently precise without being pedantically long. In all these matters, and they are of the greatest importance to working botanists, Dr. Weddell's work is worthy of imitation; we write under a smarting sense of the intolerable amount of useless labour some continental botanists ruthlessly demand of us, by giving specific characters of a page and more long, containing descriptions of the genus, order, and often of the class too, followed by an unarranged and often, in part, unintelligible list of habitats and localities, where the same fact is often stated in several different forms, all tending, in most cases, to prove that the author does not know the character of his plants, nor the geography of its habitats, and that he has not the skill to detect the one, and will not take the trouble to learn the other.

Synonymy has proved the greatest enemy to Dr. Weddell's progress; he has collected and verified upwards of 1000 synonyms! for the 470 species described; and when it is considered that upwards of 100 of these 470 species are described for the first time by Weddell himself, either in the 'Monographie' or in his previous preparatory review of the Order, and that at least another 100 are either doubtful species or are unknown to him, it may well be imagined that, great as is the service he has rendered to the Order, it is yet far from completely relieved of this incubus. It is evident that each of the 370 previously described species has about four *ascertained* names on the average. Some indeed have an incredible number; thus *Parietaria* is reduced to 8 species, of which *P. officinalis* has 8 synonyms, and *P. debilis* 14; *Pouzolzia ovalis* has 11 synonyms, *P. Indica* has 25; *Bœhmeria nivea* (the famous China Grass) has 8, *B. platyphylla* upwards of 30, and the common Nettle (*Urtica urens*) 12.

A review of a carefully executed work of this description is very suggestive of speculations on the future advance of this branch of botany, founded on the opportunities available at the present time. Dr. Weddell, having exhausted more than the means usually at a monographist's disposal for gaining a full knowledge of his subject, finds that out of 370 species described by others, there are nearly 100 of which he has not been able to obtain a personal knowledge, and yet this is an Order whose species are easily preserved, and the specimens generally charac-

teristic. The remaining 270 include a vast multitude of species of other authors, which but for actual inspection he would not have been able to reduce; whence there is good reason to suppose that a considerable proportion of the unknown 100 would, if examined by Dr. Weddell, share the same fate. And if so large a percentage of described species are virtually inaccessible to him, and left in doubt at the close of the first century of the systematic study of Nettles, what are the prospects of the systematist at the end of the next? especially if authors persist in loosely characterizing species, often from single specimens, at the rate they have been doing. Again, after the first part of Mr. Weddell's work has appeared in Paris, and whilst the second is announced as ready, and when his labours are so widely and well known and appreciated that most botanists have been glad to place their materials in his hands, a learned botanist in another country, with no materials but what his own herbarium and library afford, suddenly publishes monographs of some of the largest genera of *Urticeæ*, in which monographs Dr. Weddell finds his own labours wholly ignored. The mischief and confusion thus effected is incalculable; of their probable extent some idea may be formed from the facts mentioned by Dr. Weddell in his appendix, from which it may be gathered that whereas he has in his monograph 39 species of *Bœhmeria*, whereof 7 or 8 are doubtful, and only 17 bear his own name, Mr. Blume's monograph possesses upwards of 40 additional specific names, with his own appended. There is, in short, no parallelism whatsoever between the genera *Bœhmeria*, *Parietaria*, and *Pouzolzia*, as worked out by Blume and Weddell; they might be supposed to belong to different Natural Orders, or to have been described from different genera and species, so utterly at variance are they in nomenclature and method of treatment.

We cannot conclude without expressing a hope that Dr. Weddell will proceed to the elucidation of the *Artocarpeæ*, *Moreæ*, etc. with the same care, energy, and knowledge which distinguish his Monograph of *Urticeæ*.

MIQUEL, F. A. W.; *Flora van* Nederlandsch Indië; FLORA INDIÆ BATAVÆ. 8vo. (with Plates.) Amsterdam and Utrecht.

A work of no small importance to the botanical world is now in course of publication in Holland, by our excellent friend Dr. and Professor Miquel; namely, a Flora of the Dutch East Indian possessions,

so rich in vegetable treasures. Thanks to the labours of Rumphius, Blume, Spanoghe, Hasskarl, Teysmann, Junghuhn, Holle, Horsfield, Zollinger, Korthals, Reinwardt, and, not least, of De Vriese, and the previous writings of Miquel himself, etc. etc., much had been done, vast materials had been provided, contributing towards a complete botanical history of the Malay Archipelago; yet no attempt had been made to combine the whole, to collect the many species recently obtained—but yet unpublished—into one systematically arranged work. The honour of accomplishing this was reserved for Dr. Miquel; and the extensive collections at his disposal, together with his familiarity with the vegetation in question, render this comparatively an easy task to him; so that, though only commenced in July 1854, ten Parts, each of about 160 pages, are before the public. These portions are not however all consecutive: the first volume, for example, devoted to the "Dicotyledones Polypetalæ," but which includes *Juglandineæ* and *Cupuliferæ*, extending to 864 pages, is not yet complete.

Of vol. ii. (*volumen alterum*), devoted to "Dicotyledones Monopetalæ," three parts only are yet published. Of vol. iii. (*pars prima*), devoted to "Monocotyledones," two parts have appeared. The first of these is indeed the earliest in point of date. The generic and specific characters and descriptive matter are written in Latin; the observasions, economic properties, etc., generally in Dutch.

The work commences with LEGUMINOSÆ, which occupies 349 pages, and includes upwards of 100 genera. MYRTACEÆ is also an extensive family, embracing, as it does, 70 species of *Jambosa;* the new genus *Macromyrtus* of Miquel (allied to *Jambosa*, but with a very peculiar calyx); 14 of *Eugenia;* 35 of *Syzygium;* 4 of *Caryophyllus;* 4 of *Jossinia;* 13 of *Nelitris; Rhodamnia*, Jack, 8 species; *Barringtonia* has 20 species; *Planchonia*, Bl., 2 species; *Sonneratia*, 7 species. MELASTOMACEÆ reckons 28 genera; CUCURBITACEÆ 16. BEGONIACEÆ is by no means so numerous as on the Indian continent and in tropical America. *Modecca* is the principal genus in PASSIFLOREÆ; *Henslovia*, in HENSLOVIACEÆ, reckons 6 species; UMBELLIFERÆ is poorly represented in Netherlands India; ARALIACEÆ has 10 genera, of which *Paratropia* reckons 23 species; LORANTHACEÆ has 7 genera, but no true *Loranthus*, as now restricted. Among CUPULIFERÆ, *Quercus* alone includes 43 species.

The two first parts of vol. ii. are mainly devoted to COMPOSITÆ and RUBIACEÆ; the third Part leaves ASCLEPIADEÆ unfinished.

Of the two Parts of vol. iii., the first is devoted to the PALMS (including *Nipa*) and PANDANEÆ (*Pandanus* 22 species, and *Freycinetia* 14). AROIDEÆ and ORONTIACEÆ, in the second part, are tolerably numerous. JUNCAGINEÆ is represented by a genus which we should little have expected in such a Flora, *Scheuchzeria Asiatica*, Miq. This Part closes with the seventeenth species of *Carex*, among CYPERACEÆ.

The plates seem to be faithful representations of the respective plants, with careful dissections; they average two to each number. We cannot but wish every success to so laborious an undertaking.

PLANTÆ JUNGHUHNIANÆ: *Enumeratio Plantarum quas in insulis* Java *et* Sumatra *detexit* FR. JUNGHUHN. Fasc. 4. 1851–1855.

This is one of the many writings alluded to in the preceding notice, which has contributed in no small degree to our knowledge of the vegetable productions of the Dutch East Indian Archipelago, and is specially confined to the plants of *Sumatra* and *Java*, detected by M. Junghuhn, and published without any systematic arrangement of the families. Thus the work begins with *Coniferæ*, *Casuarineæ*, *Cupuliferæ*, *Piperaceæ*, *Urticaceæ*, *Moreæ*, *Artocarpeæ* by Miquel; and is followed by *Ranunculaceæ*, *Papaveraceæ*, *Nymphæaceæ*, *Nelumbiaceæ*, *Dipterocarpeæ*, *Epacrideæ*, *Primulaceæ*, by De Vriese; *Umbelliferæ*, by Molkenboer; *Aroideæ* and allied families by De Vriese; *Loranthaceæ* by Molkenboer; *Violarieæ* by Burgersdyk; *Polygalaceæ*, *Amaranthaceæ*, *Commelynaceæ* by Hasskarl; *Palmæ*, *Pandaneæ*, *Nepentheæ*, *Lemnaceæ*, *Characeæ*, and a host of minor Orders, by Miquel; *Leguminosæ* by Bentham; *Lycopodineæ* by Spring; *Malvaceæ* and allied Orders by Miquel; *Polygoneæ* by De Bruyn; *Musci Frondosi* by the late able Muscologists, Dozy and Molkenboer; *Gramineæ* by Buse; *Sapindaceæ*, etc., Miquel; *Lichenes* by Montagne and Van den Bosch; *Compositæ* by Miquel (on whom has fallen the labouring oar); and lastly, still unfinished, *Hepaticæ* by Van der Sande Lacoste. The whole is written in Latin;—a bare enumeration of name and one or more synonyms when the plant is well known; generic and specific characters and descriptions when considered necessary. The work needs a good Index when the Natural Families are so intermingled. It extends at present to 522 pages, and contains very many new species.

Ludwig Becker del, W Fitch lith

Vincent Brooks Imp

Josephinia Eugenia, F. Mueller

FLORULA HONGKONGENSIS: *an Enumeration of the Plants collected in the* Island of Hongkong, *by* Major J. G. Champion, 95*th Regt.; the determinations revised and the new species described by* GEORGE BENTHAM, ESQ.

(*Continued from p.* 344.)

The FILICES; *by* SIR W. J. HOOKER.

POLYPODIACEÆ.

POLYPODIEÆ.

1. Polypodium *vulgare*, Linn.

HAB. Hakodadi, Japan, *Dr. Baine, of H.M. Sybille (in Herb. Harland)*.

This corresponds with the narrow form of North America. The sori are copious and confluent, the veins obscure. Costa of the subspathulate segments slender, black on the under side.

2. Polypodium (Phegopteris) *rugulosum*, Lab. Nov. Holl. ii. p. 92. t. 241.—*Hook. Fl. Nov. Zeal.* ii. *p.* 41. P. viscidum, *Spr.*

HAB. Chusan, *Alexander.*

This has a very close affinity to certain states of *Hypolepis tenuifolia*; see our remarks under that species, in the Gen. et Sp. Fil. ii. p. 61. Our present plant has no trace of an involucre, and is identical with the *P. rugulosum*, Labill.—A native of various warm countries.

3. Polypodium (Phegopteris) *tenericaule*, Wall.; sesquipedale ad bipedalem, fronde ovato-acuminata bi-tripinnata submembranacea siccitate fuscescente glabra, pinnis plerisque sessilibus sursum curvatis, primariis longe subcaudato-acuminatis, secundariis pinnulisque lineari-lanceolatis profunde pinnatifidis, laciniis anguste ovatis marginibus (in sicco recurvis) 2–6-soris, stipite elongato basi paleaceo rachi primariaque pallide fuscis nitidis lævibus, pinnarum rachibus ubique alatis costisque subtus pilis longis patentibus albis villosis.—Polypodium tenuicaule, *Wall. Cat. n.* 335. Polypodium trichodes, *Reinw. Herb. fide J. Sm. En. Fil. Philip. in Hook. Journ. of Bot.* iii. *p.* 394 (*name only*).

HAB. China, *Mr. Alexander.*

As far as my researches have gone, I can find no description of this common and well-marked Indian Fern. Dr. Wallich distributed this species among the very earliest of his collections from the "mountains

of Sylhet," under the name of his printed catalogue of *P. tenericaule*, and it is found from the Concan in the West, to Assam, and Mishmee, and Sincapore, and the Malay Islands, and China, in the East. Cuming's Philippine-Island sets exhibit it under Nos. 1, 75, 114, 212, 355, and 412! Nos. 1, 75, and 412, Mr. J. Smith referred to a species he possessed in his herbarium, named *P. trichodes* by Reinwardt, but this is nowhere published: and he makes the observation, "This agrees with *Polypodium ornatum* of Wallich, which is probably not distinct from *Polypodium rugulosum* of Labillardière. The latter species is distinct enough, but *R. ornatum* of Wallich, with many points in common, yet I think possesses sufficiently distinguishing marks. The two agree in the form of the pinnules and lobes, and in the lax, white, patent, glistening hairs of the rachises:—but *P. ornatum** is a much larger plant, with long primary pinnæ; pinnæ and pinnules spreading horizontally, the segments narrow; but above all, the stout stipes and the principal rachises are partially paleaceous, with lanceolate scales, and always muricated."

1. Meniscium *simplex*, Hook. Lond. Journ. Bot. 1842. *t.* 11.

HAB. Chusan, *R. B. Hinds, Esq.*, *Alexander.* Hongkong, *Colonel Champion*, *Seemann*, *J. C. Bowring, Esq.*, *n.* 8, *Dr. Harland.*

Dr. Harland's specimens are more hastate than those figured in Lond. Journ. Bot., from Mr. Hinds; but in other respects the same.

1. Brainea *insignis*, Hook. Bowringia insignis, *Hook. Journ. of Bot.* vi. *p.* 237. *t.* 2.

HAB. Hongkong, *Messrs. Bowring*, *Major Champion*, *n.* 294, 295. (Dr. Hooker detected it in the Khasya hills, Eastern Bengal.)

This remarkable plant, of which we have now seen specimens with the fructifications by no means confined (as represented in the 'Journal of Botany,' l. c.) to the venation next the midrib, has a stout, arborescent caudex, in our stove, 2 feet long, and as thick as one's arm.

* This species may be thus distinguished:—

Polypodium (Phegopteris) *ornatum*, Wall.; 3–4-pedale et ultra, fronde amplissima 3–5-pinnata submembranacea (siccitate fuscescente) glabra, pinnis plerisque sessilibus horizontaliter patentibus, ultimis lanceolato-acuminatis pectinato-pinnatifidis laciniis oblongo-linearibus obtusis dentatis plurisoris, stipite bi-tripedali crasso insigniter squamoso rachibusque pallide fuscis parce squamosis muricatis, costis subtus præcipue pilis longis patentibus albis villosis.

HAB. Nepal, 1820, *n.* 327, *Wallich.* Bootan (*n.* 2734), and Mishmee, *Griffith.* Great Runjeet River, Sikkim, *n.* 216, *Drs. Hooker and Thomson.* Ceylon, *Mrs. Walker*, *Gardner*, *n.* 1150.

The name of its original discoverer, and who first communicated living plants to our Garden, had previously been given to a Leguminous plant by Mr. Bentham, see Journ. of Bot. iv. (1852), p. 75; and we now dedicate this curious genus to C. J. Braine, Esq., from whom we have also received living plants.

1. Niphobolus *carnosus*, Bl. Fil. Jav. p. 50. t. 19.

HAB. South China, *Seemann.*

A species remarkable for the short, obtuse, spathulate sterile fronds, and the elongated, linear, obtuse fertile ones, but we possess forms which seem to connect this with the following, *N. pertusus*, Spr.

2. Niphobolus *pertusus*, Spr. Polypodium pertusum, *Roxb. Hook. Ex. Fl. t.* 162. N. varius, *Kaulf.—Blume, Fil. Jav. p.* 54. *t.* 21.

HAB. Chusan and Foo-chow-foo, *Mr. Alexander.* Hongkong, *Col. Champion, n.* 300.

A common form of *Niphobolus,* well represented in the 'Exotic Flora' and in Blume's Fil. Jav., but this passes insensibly into others, which are by some considered distinct species.

3. Niphobolus *Lingua*, Spreng. Syst. Veg. iv. p. 45.—*Kunze in Schkh. Fil. Suppl. p.* 144. *t.* 63. Polypodium Lingua, *Sw., Willd. Langsd. et Fisch. Ic. Fil. p.* 7. *t.* 5. Acrostichum Lingua, *Thunb. Fil. Jap. p.* 330. *t.* 33.—*Schk. Fil. t.* 1. Polycampium, *Presl, Epimel. Bot.* 135.

HAB. Nangasaki, Japan, *Miss Nelson, Mr. Babington.* Hongkong, *Dr. Harland.*

4. Niphobolus *hastatus*, Kze. in Bot. Zeit. vi. (1848) p. 505.—*Fée, Gen. Fil. p.* 263. Polypodium tricuspe, *Sw. Syn. Fil. p.* 30.—*Willd. Sp. Pl.* v. *p.* 63.—*Spreng. Syst. Veg.* iv. *p.* 49. Acrostichum hastatum, *Thunb. Fl. Jap. p.* 331. *t.* 34. Polycampium hastatum, *Presl, Epimel. Bot. p.* 137.

HAB. Japan (Fusi-a-Falcon), *Thunberg.* Southern part of Korea, *Dr. Clarke (in Herb. Harland).*

This has every appearance of a true *Niphobolus*, as far as can be judged without investigating the venation, which can only be done by sacrificing our specimens of a very rare plant, and with difficulty then. Presl refers it to his new genus *Polycampium*, but remarks, "Præter iconem non vidi: hæc quemadmodum Swartzii verba speciem Niphobolaceam indicant."

1. Pleopeltis *nuda*, Hook. Ex. Flora, t. 62. Lepisorus nudus, *J. Sm.* Polypodium Wightianum, *Wall.*

Hab. Nangasaki, Japan, *Mr. Babington.* Foo-chow-foo, *Mr. Alexander.*

1. Drynaria *longifrons*, Fée. Polypodium longifrons, *Wall. in Hook. et Grev. Ic. Fil. t.* 65.

Hab. Moist places, Sam-la Bay. Foo-chow-foo, *Mr. Alexander.*

Our specimens are usually broader in the frond than the figures above quoted, and the sori are sometimes in a single line near the midrib.

2. Drynaria *irioides*, J. Sm. Phymatodes irioides, *Presl, Tent. Pterid. p.* 195. *f.* 14. Polypodium irioides, *Poir.—Hook. et Grev. Ic. Fil. t.* 125.—*Bl. Fil. Jav. t.* 77. Microsorium irioides, *Fée.*

Hab. Chusan, *Alexander?* Camoens' Cave, Macao, *Dr. Harland.*

Dr. Harland's specimens from Macao are small, the largest not exceeding a foot in length, and the sori are larger than in the normal state of *P. irioides.*

3. Drynaria *elongata?*, Fée, Gen. Fil. p. 270. Pleopeltis elongata, *Kaulf. Enum. Fil. p.* 246.

Hab. Foo-chow-foo, along the coast, on trees, rocks, and in moist places, *Mr. Alexander.*

I am very doubtful about this species. It very much resembles the *Pleopeltis ensifolia*, Hook. Exot. Fl. t. 62, which Presl refers to *Pleopeltis linearis* of Kaulfuss, but which Presl himself includes in *Polypodium.* Indeed our own specimens from Foo-chow-foo exhibit varieties or species, some with blunt and some with an acuminated apex; some with very large, others with small sori; some have scales on the under side of the frond, others very few or none. They belong to a form of small, simple-fronded *Drynariæ* (or *Pleopeltides*), which are found in different parts of the world, and which require much care to distinguish specifically.

4. Drynaria *Phymatodes*, Fée. Phymatodes vulgaris, *Presl.* Polypodium Phymatodes, *Linn.*

Hab. Hongkong, *Dr. Dill.*

About 14 inches long in the frond. Our specimens are a common pinnatifid form of this species.

5. Drynaria *subspathulata;* caudice repente copiose radiculoso, frondibus parvis bi- vix tri-uncialibus subcoriaceis costatis lineari-spathulatis nudis dorso nigro-punctatis basi in stipitem brevissimum attenuatis marginibus paululum recurvis, soris paucis 4–8 in apicem frondis in duabus lineis seriatim dispositis.

Hab. Hongkong, *J. C. Bowring, Esq.*

Only three specimens of this small but peculiar-looking plant are in the collection. The colour, especially on the under side, is a bright green, above darker-coloured, and minutely dotted with black points, indicating the clavate termination of the free veinlets in the areoles. The apex of the fertile specimens beneath is occupied by from four to eight large almost orange-coloured orbicular sori in two rows, closely placed, and each row or series occupying the whole space between the costa and the margin. There are no scales in the sori, as in the *Pleopeltis*-group. Mr. Smith considers it allied to his *Drynaria* (or *Phymatodes*) *stenophylla* of Cuming's collection (n. 122), of which Fée says, "An genus distinctum?"

6. Drynaria *tridactylis*, Fée. Polypodium tridactylon, *Wall. in Hook. et Grev. Ic. Fil. t.* 209.

Hab. Hongkong, *Colonel Champion.*

This is also a native of Sylhet, where it was discovered by *Dr. Wallich;* and of Mishmee (*Mr. Griffith*).

7. Drynaria *hastata*, Fée.—*Asa Gray in Williams and Morrow's Japan Pl. p.* 329. Polypodium hastatum, *Thunb. Fl. Jap. p.* 335. *t.* 34.—*Ic. Pl. Jap.* iii. *t.* 10.—*Kunze in Schkuhr, Fil. Suppl. p.* 198. *t.* 83.

Hab. Nangasaki, Japan, *Thunberg, Goring (Mr. Babington).*

A very well-marked species, of a glaucous-green colour, well figured both by Thunberg in his 'Icones,' and by Kunze in his Supplement to Schkuhr's 'Filices,' which is more than can be said of the figure in 'Flora Japonica.'

8. Drynaria *quercifolia*, Bory.—*Fée, Gen. Fil. p.* 271. Polypodium quercifolium, *Schk.*

Hab. Foo-chow-foo, and on rocks and walls, covering the old Fort at Tung-tam, *Mr. Alexander.*

9. Drynaria *coronans*, J. Sm. Polypodium coronans, *Wall. Cat. n.* 288. Drynaria morbillosa, *Presl, Pterid. p.* 197. Polypodium morbillosum, *Presl, Reliq. Hænk.* i. *p.* 22. *t.* 3. *f.* 3.

Hab. Lung-tong; mainland, north-west from Hongkong, *J. C. Bowring, Esq.*

This species has long been distributed among botanists under the name of *Polypodium coronans*, and it is cultivated in gardens under the name of *Pol.* (Drynaria) *morbillosum* of Presl, whose figure of a segment of a frond (from Java) in the 'Reliquiæ Hænkeanæ,' sufficiently

accords with our present specimen. But neither does Presl, who appears to have had imperfect specimens, nor Mettenius (Fil. Hort. Bot. Lips. p. 37), who seems to have had an entire specimen, notice the peculiar form of the base of the frond, where the segments are contracted and decurrent, becoming more dilated at the very base, forming, one might say, a very broad wing at the base of the stipes (4–5 inches across), of a brown colour, and more pellucid than the rest of the frond; in short, of the same nature as the sterile frond of *Drynaria quercifolia:* there the two kinds of frond are distinct, here they are united into one. The specimen before us, from Hongkong, is nearly three feet long, and is yet destitute of its apex.

1. Nothochlæna *pilosa*, Hook. et Arn. Bot. of Beechey's Voy. p. 74 and 255.

HAB. Hongkong, *Dr. Dill.*

1. Selliguea *decurrens*, Presl. Grammitis decurrens, *Wall.—Hook. et Grev. Ic. Fil. t.* 6. Colysis pothifolia, *Pr.; Fée.* Hemionitis pothifolia, *Don, Prodr. Nep. p.* 13.

HAB. Foo-chow-foo, *Mr. Alexander.* Hongkong, *Colonel Champion, Dr. Harland.*

The specimens are smaller than the plant figured in the 'Icones Filicum,' from Nepal, and the frond is more deeply pinnatifid almost to the rachis, quite pinnate below.

1. Drymoglossum *carnosum*, Hook. Gen. Fil. t. 78 *A.* Notochlæna (Tænitis?) carnosa, *Wall. Cat. n.* 138. Lemmaphyllum carnosum (*et* L. spathulatum?), *Presl, Epimel.* Drymoglossum subcordatum, *Fée, Gen. Fil. t.* 9 *A. f.* 1. Pteris piloselloides, *Thunb. Jap. p.* 331. —*Ic. Sel. Plant. Kæmpf. t.* 31.—*Kæmpf. Amœn. Exot. p.* 887.

HAB. South China, *Seemann.* Pih-quan, *Mr. Alexander.* Hongkong, *J. C. Bowring, n.* 18. Nangasaki, Japan (*Babington*).

This is a very different Fern from the *Drymoglossum piloselloides* of Presl, being much smaller, and having the lines of fructification not marginal but between the costa and the midrib. On this account Presl has made of this and his supposed species, *D. spathulatum*, the genus *Lemmaphyllum* (v. his 'Epimelia Botanica' above quoted). M. Fée's figure of his *Drym. subcordatum* exactly agrees with our specimens of *carnosum.* The fertile fronds vary in their more or less spathulate form, and in being more or less stipitate. The fertile fronds are sessile or petiolate, oval, ovate, or cordate, or orbicular. It is more than pro-

bable that this is the *Pteris piloselloides* of Thunberg, and of the Ic. Select. of Kæmpfer: and the latter figure sufficiently corresponds.

ACROSTICHEÆ.

1. Heteroneuron *proliferum*, Fée, Mém. Acrost. p. 95. t. 5. Polybotrya prolifera, *Bory*, *Belang. Voy. p.* 18. Heteroneuron sinuosum, *Fée*, *Mém. Acrostich. p.* 95. *t.* 55. Cyrtogonium sinuosum, *J. Sm. in Hook. Journ. Bot.* iii. 1841. *p.* 403 (*name only*).

HAB. Foo-chow-foo, *Mr. Alexander.* Hongkong, *J. C. Bowring, Esq.*, *n.* 23.

This exactly agrees with the figure above given by Fée, of *Heteroneuron proliferum:* nor does it appear that *Cyrtogonium sinuosum*, of J. Smith, is different.

1. Gymnopteris *decurrens*, Hook.; fronde sterili ampla submembranacea nitida pinnata, pinnis subquinque ovali-lanceolatis longe tenui-acuminatis obscure sinuatis basi decurrentibus tribus superioribus coadunatis terminali maxima, fertili multo minore rigidiore, pinnis angustioribus vix acuminatis repando-sinuatis, stipite elongato rachibusque castaneis nitidissimis.

HAB. Hongkong, *Dr. Harland.*

I do not find any species of *Gymnopteris*, to which genus or group of *Acrostichum* this belongs, which accords with this. Its nearest affinity—unless it can be the normal or perfect state of *G. subsimplex*, of Fée, Acrostich. t. 40. f. iii., *G. subrepanda ?*, J. Sm., the only oriental species of the genus—is with the *G. nicotianæfolia*, Pr., and *G. semipinnatifida*, Fée, but they are South American species, and very distinct. All that I have seen of this plant are, a very good sterile, and an equally good fertile, frond, in Dr. Harland's collection. The former (sterile frond) is rather more than 1½ foot long and 14 inches broad, divided into five pinnæ, of which the lateral ones are nearly opposite, 8–9 inches long; the terminal one 14 inches long, all oval- or broad-lanceolate, tapering into a long, narrow point, subsinuate at the margin, the bases decurrent, the three upper ones very much so, and coadunate; the two lowest remote from the rest, and much less decurrent. Venation conspicuous; primary veins parallel, oblique, nearly straight; veinlets copiously reticulated with free veins in the areoles (areolæ appendiculatæ). Stipes stout, and rachises also stout and prominent on the under side, dark chestnut-brown, very glossy. Fertile frond exactly

similar in composition, with the same number of pinnæ, but only 7 inches long, and narrow in proportion, of a more rigid texture, and darker colour; pinnæ more sinuose at the margin, less acuminate at the point, the whole under side covered with the copious fructifications. The stipes, though broken in both specimens, is twice as long as the frond in the fertile plant. It is a very fine species.

PSEUDO-FILICES.

OSMUNDACEÆ.

1. Osmunda *regalis*, L.—Var. fertile and sterile fronds separated.—O. speciosa, *Wall. Cat. n.* 50.

HAB. Hongkong, *Herb. Harland, J. C. Bowring, Esq.*

This state of the plant, with sterile and fertile fronds distinct, though rare in Europe, is not uncommon in India, where also the common form is found, viz. with the lower portion sterile, the upper fertile.

2. Osmunda (Plenasium) *Javanica*, Blume, Enum. Pl. Jav. p. 252.—*Hook. et Grev. Enum. Fil. in Bot. Misc.* iii. *p.* 231.—*Presl, Suppl. Tent. Fil. p.* 66.—*Kunze, Fil. Suppl. t.* 111. O. Vachellii, *Hook. Ic. Pl.* i. *t.* 15.—*Hook. et Arn. in Bot. Beech. Voy. p.* 255.—*Presl, Suppl. Tent. Fil. p.* 66. O. Zeylanica, *Kunze, Fil. Suppl. t.* 122.

HAB. Lappas Island, *Rev. Mr. Vachell.* Macao, *Beechey.* Chusan, *Mr. Alexander.* Hongkong, *Dr. Harland.*

A very variable species it must be confessed, with sterile pinnæ, sometimes short and obtuse and entire, sometimes elongated, much acuminated, and deeply and sharply serrated, and lobato-serrate, like the leaves of *Comptonia aspleniifolia.* Sometimes the fertile pinnæ occupy the base, sometimes the middle, and even the apex of the frond. There can be no question but that our *O. Vachellii*, as well as the *O. Zeylanica* of Kunze, must be united to *O. Javanica.*

3. Osmunda (Plenasium) *bipinnata*, Hook.; bipinnata subcoriacea glabra, pinnis lanceolatis, pinnulis oblongo-ovatis obtusiusculis sessilibus superioribus basi inferne decurrentibus terminali maxima elongato-lanceolata integris vel subsinuato-lobatis, pinnis fertilibus lateralibus pinnulis linearibus pinnatifidis.—Osmunda bipinnata, *Hook. in Filices Exoticæ,* i. *t.* 9.

HAB. Hongkong, *Dr. Harland.*

A most distinct and well-marked species, peculiar, as far as we at present know, to Hongkong.

4. Osmunda (Plenasium) *cinnamomea*, Linn.

HAB. Japan, *Dr. Babington* (*Herb. Harland*).

A well-known inhabitant of the United States and Canada, its range extending south to Mexico (*Liebmann*), New Granada (*Purdie*), and Brazil (*Gardner*), but never till now found in any part of Asia, nor has it yet been detected on the west or Pacific side of North America. The nearly-allied species (more near than botanists seem generally aware) *Osmunda Claytoniana*, L. (*interrupta*, Mich.), is however frequent in Assam, Khasya, and the Himalayan regions, Bootan, etc., and is the *O. pilosa*, Wall. MSS., and of Hook. and Grev. Enum. Fil. in Bot. Misc. iii. p. 229.

LYGODIACEÆ.

1. Lygodium *scandens*, Sw.—*Presl, Suppl. Tent. Pterid.*—L. microphyllum, *Br. Prodr.* 162.—*Blume, Enum. Fil. Jav.* 255. Ugena microphylla, *Cav. Ic.* vi. *p.* 76. *t.* 595. *f.* 2. Ophioglossum scandens, *L.*

HAB. China and Cochinchina, *Loureiro*. Hongkong, *Major Champion, J. C. Bowring, Esq.*, *n.* 5. South China, *Seemann*, *n.* 2383.

Cavanilles' figure admirably represents both the barren and fertile state of this plant.

2. Lygodium *Japonicum*, Sw. Hydroglossum Japonicum, *Willd. Hort. Berol.* ii. *p.* 84. *t.* 84. Ophioglossum Japonicum, *Thunb. Fl. Jap. p.* 328.

HAB. Canton and Macao, *Osbeck, Thunberg, Vachell*. Hongkong, *Major Champion, J. C. Bowman, Esq.*, *n.* 12. Chusan, Foo-chow-foo, and Tung-tan, *Mr. Alexander*. Nangasaki, Japan, *Mr. Babington.*

Some of our specimens, both in the sterile and fertile fronds, exactly resemble the figure of the Hortus Berolinensis; in other specimens the fertile pinnules are much larger and less divided; in some they quite resemble those of *L. scandens*, but the sterile pinnules are always more divided.

3. Lygodium *circinatum*, Sw. — *Presl, Suppl. Tent. Pterid. p.* 100. L. pedatum, *Sw.* Hydroglossum circinatum, *Willd.* — *Poir, Dict. Scienc. Nat., cum ic.* Ophioglossum pedatum, *Burm. Fl. Ind.* 227. *t.* 66. *f.* 1 (*ætas juvenilis*). Ophioglossum flexuosum, *Linn.* Adiantum volubile, *Rumph. Amb.* vi. *p.* 75. *t.* 33.

HAB. Hongkong, *Dr. Dill, J. C. Bowring, Esq.*, *n.* 11. Chusan, *Mr. Alexander.*

This is a very fine species; our specimen from Mr. Alexander has the lobes of the sterile pedate fronds a foot long and an inch wide, and we have equally large ones from Mr. Bowring.

Marattiaceæ.

1. Angiopteris *evecta*, Hoffm.—*Schkuhr, Fil. t.* 150.—*Hook. Ic. Fil. t.* 10.—*Gen. Fil. t.* 26.

Hab. San-la Bay, *Mr. Alexander.* Hongkong, *J. C. Bowman, Esq., n.* 36.

I believe this plant to be specifically the same as what is figured in Ic. Fil. and Gen. Fil. as the *A. evecta*, but I confess I do not understand the numerous species which have lately been made in this genus.

Lycopodiaceæ.

Psilotum *triquetrum*, Sw.

Hab. Hongkong, *Dr. Dill.*

1. Lycopodium *cernuum*, L.—*Spring, Monogr. Lycop.* ii. *p.* 37.

Hab. Hongkong, *J. C. Bowring, Esq., n.* 37.

2. Lycopodium *serratum*, Thunb. Fl. Jap. p. 341. t. 8.—*Hook. et Grev. Ic. Fil. t.* 37.—*Spring, Monogr.* i. *p.* 39.

Hab. Tung-lan, *Mr. Alexander.*

3. Lycopodium (Selaginella) *atroviride*, Wall. Cat. n. 120.—*Hook. et Grev. Ic. Fil. t.* 39.—*Spring, Monogr. Lycop.* ii. *p.* 124.

Hab. Moist banks of ravines, Hongkong, *J. C. Bowring, Esq., n.* 38, *Dr. Harland.* Chusan, *Mr. Alexander.*

4. Lycopodium (Selaginella) *caudatum*, Spring, Monogr. Lycop. ii. p. 139. L. Durvillæi, *Bory, in Duperrey's Voy. Bot.* i. *t.* 25. L. canaliculatum, *L.—Hook. et Arn.*

Hab. Hongkong, mixed with *L. atroviride* (n. 38), *J. C. Bowring, Esq.*, *Major Champion.*

5. Lycopodium (Selaginella) *monospora*, Spring, Monogr. Lycop. p. 135.

Hab. Foo-chow-foo and Hongkong, *Mr. Alexander.*

Very near *L. atroviride*, but the awns on the stipules are much shorter.

6. Lycopodium (Selaginella) *semicordatum*, Wall. Cat. n. 126.—*Hook. et Grev. Enum. Fil. n.* 138. L. flaccidum, *Bory, in Belang. Voy. Bot.* ii. *p.* 9.—*Spring, Monogr.* ii. *p.* 105.

Hab. Chusan, *Mr. Alexander.*

7. Lycopodium (Selaginella) *caulescens*, Wall. Cat. n. 137.—*Spring, Monogr. Lycop.* ii. *p.* 158.

HAB. Foo-chow-foo and Chusan, *Mr. Alexander.*

8. Lycopodium (Selaginella) *involvens*, Thunb. Fl. Jap. p. 541.—*Spring, Monogr. Lycop.* ii. *p.* 53.

HAB. Hongkong, *Major Champion, n.* 303.

A very beautiful species, forming an underground trunk or nearly erect caudex of its densely interlaced roots.

9. Lycopodium (Selaginella) *flabellatum*, L.—*Spring, Monogr. Lycop.* ii. *p.* 174.

HAB. Hongkong, *Dr. Harland.*

Enumeration of the MOSSES *collected in* India *by* DR. J. D. HOOKER, F.R.S., *and* DR. THOMAS THOMSON, F.R.S., *with their habitats, elevations, and the numbers under which they have been distributed; arranged by* W. MITTEN, ESQ., *and named by* W. WILSON, ESQ.

(*Continued from p.* 333.)

No. 520. Bryum *argenteum*, var.—HAB. Mont. Khasia temperata; Kollong, J. D. H. et T. T.

546. *Id.*—HAB. Himalaya occid. temp.; Simla, alt. 7,000 ped., T. T.

515, 533, 534. Var. seta longiore.—HAB. Ceylon, *Gardner.*

518, 522, 523, 536, 539. Brachymenium *filiforme*, Griffith, Musci Assam. (*Bryum* potius).—HAB. Mont. Khasia temp. et subtrop., alt. 2–5,000 ped., J. D. H. et T. T.

513. *Id.*—Nipal orient. temp.; Tambur river, alt. 7,000 ped., J. D. H.

519. Var.? (sterile).—HAB. Sikkim-Himalaya trop.; Ratong river, alt. 3,000 ped., J. D. H.

556. *Id.?* (c. fr.).—HAB. Sikkim-Himalaya temperata, alt. 5–6,000 ped., J. D. H.

545. Bryum *moniliforme*, Wils. MSS. (sterile) (*B. julaceo* et *Brachymenio filiforme* affine).—HAB. Tibet occid. alp.; Ladak, Shayuk valley, alt. 14,000 ped., T. T.

557. Bryum *inflatum*, Wils. MSS. (*B. blando* affin.)—HAB. Tibet alpina; Lanak Pass, Ladak, alt. 15–18,000 ped., T. T.

400. Bryum *distans*, Wils. MSS. (*B. blando* affin.).—Hab. Tibet temperata; Shayuk valley, Ladak, alt. 10,000 ped., T. T.

402. Bryum (sterile), *B. Ludwigii*, Spreng., affine (foliis longioribus). — Hab. Sikkim-Himalaya alpina; Tunkra, alt. 12,000 ped., J. D. H.

435. Bryum *pachypoma*, Mart. (forma major).—Hab. Mont. Jyntea Bengaliæ orient. subtrop., alt. 4,000 ped., J. D. H. et T. T.

478. *Id.*—Hab. Khasia subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

580, 530. Var.—Hab. Sikkim-Himalaya temperata; Tonglo, alt. 7–10,000 ped., J. D. H.

490. Bryum *pachypoma*.—Hab. Nipal orient. temp.; Khabili, alt. 6,000 ped., J. D. H.

418. *Id.* (cum *B. turbinatum* immixtum), fol. crispat.—Hab. Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

535. *Id.*—Hab. Sikkim-Himalaya tropica; Yoksun, alt. 3,000 ped., J. D. H.

553. *Id.* (♂ plt.)—Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

432. Var.—Hab. Ceylon, *Gardner*.

447. Bryum *pachypoma*, var.—Hab. Sikkim-Himalaya temperata; Chola, alt. 10–12,000 ped., J. D. H.

473. Var. alt. fol. angustiorib.—Hab. Nipal orient. temp.; Phulloot, alt. 9,000 ped., J. D. H.

413. Var.? (sterile).—Hab. Tibet occidentali temp.; Nubra, alt. 11,000 ped., T. T.; Ceylon, *G. Gardner*, var.? or allied sp.? (capsula brevis).

500. Bryum *cuspidatum*, Wils. MSS. (*B. pachypoma* diversum); fol. nervo longe excurrente.—Hab. Sikkim-Himalaya temperata; Lachen, alt. 6,000 ped., J. D. H.

401. *Id.* — Hab. Tibet occid. temp.; Shayuk valley, Ladak, alt. 10,000 ped., T. T.

429. Var. (cum altera specie *B. appressum?*, MS. mixta).—Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

423. Var.—Hab. Tibet occid. temp.; ad flum. Shayuk, alt. 14,000 ped., T. T.

416. Bryum, *B. appresso* affine, Wils. MSS. (an var.?)—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

401. Bryum *turbinatum*, Hedw. (*B. cuspidato* fol. sicc. crispulis vel undulatis differt).—Hab. Tibet occid. temp.; Shayuk valley, Ladak, alt. 10,000 ped., T. T.

424. Var.—Hab. Tibet occid. alp., *H. Strachey*.

415. Bryum *turbinatum*.—Hab. Tibet alpina; Ladak, alt. 16,000 ped., T. T.

405. Var. — Hab. Tibet occid. temp.; Dras, alt. 10,000 ped., T. T.

417. Var.? (sterile). — Hab. Sikkim-Himalaya alpina, alt. 16,000 ped., J. D. H.

407. Var. (sterile) (conf. *B. Schleicheri*, Schwægr.)—Hab. Tibet occid. temp.; Parang valley, alt. 10,000 ped., T. T.

406. *Id.*—Hab. Himalaya occid. temp.; Kashmir, alt. 8,000 ped., T. T.

420. Var.?—Hab. Tibet occid. temp.; Rondu, alt. 6,000 ped., T. T.

412. *Id.?*—Hab. Tibet occid. alp.; ascent to Lanak Pass, Ladak, T. T.

1144. Var. (with *Hypnum filicinum*).—Hab. Tibet occid. alp.; ad flum. Zungsam, alt. 13,000 ped., T. T.

414. Var. alt.—Hab. Tibet occid.; Iskardo, Balti, T. T.

403. *Id.*—Hab. Tibet occid. alp., *H. Strachey*.

410. *Id.?*—Hab. Himalaya occid. temp.; Kashmir, alt. 9,000 ped., T. T.

411. *Id.?*—Hab. Tibet occid. temp.; Iskardo, Balti, alt. 7,000 ped., T. T.

430. Bryum *teretiusculum*, Hook.—Hab. Nipal orient. temp.; Tambur river, alt. 8–10,000 ped., J. D. H.

436. *Id.* — Hab. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

461. Var.—Hab. Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

434. Var.?—Hab. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

452. Bryum *appressum*, Wils. MSS. (*B. Billardieri* affin.)—Hab. Himalaya occid. temp.; Chenab valley, alt. 8,000 ped., T. T.

468. *Id.* — Hab. Sikkim-Himalaya temperata; Ratong river, alt. 7,000 ped., J. D. H.

359. Bryum (sterile), allied to *B. appressum*, Wils. MSS., var.?—Hab. Tibet occident. temp.; Ladak, Shayuk valley, alt. 9,000 ped., T. T.

454. Var. alt.?—Hab. Tibet occid. temp.; Turtuk, Shayuk valley, alt. 7,500 ped., T. T.

478. Var. alt.? (still nearer to *B. Billardieri*).—Hab. Mont. Khasia subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

465. Bryum *intermedium*, Brid. (var.? seta longiori).—Hab. Tibet occid. alp.; Parang valley, Ladak, alt. 15,000 ped., T. T.

460. Bryum *torquescens*, Bryol. Eur., var.?—Hab. Himalaya occid. temp.; Kashmir, T. T.

501. Bryum *subrotundum*, Brid. (Br. Eur.)—Hab. Sikkim-Himalaya alpina; Lachen, alt. 12,000 ped., J. D. H.

453. Bryum *pallescens*, Bryol. Eur. (var.? or allied species?)—Hab. Tibet temperata; Shayuk valley, alt. 9,000 ped., T. T.

456. Bryum *pallens*, Sw., var.?—Hab. Tibet temperata; Shayuk valley, alt. 9,000 ped., T. T.

423. Bryum *pallens*, var. alt.—Hab. Tibet alpina; ad flum. Shayuk, alt. 14,000 ped., T. T.

427, 482. Var. alt.—Hab. Sikkim-Himalaya temperata, alt. 8–9,000 ped., J. D. H.

426. Var. alt. seta elongata, capsula breviori.—Hab. Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

419. Var.? (sterile).—Hab. Tibet occid. temp.; Sassar Pass, Nubra, alt. 10–12,000 ped., T. T.

410. Bryum, *B. bimo* affine, Schreb.—Hab. Himalaya occid. temp.; Kashmir, alt. 9,000 ped., T. T.

408. *Id.*—Hab. Tibet occid. temp.; Keris, Shayuk valley, T. T.

399. Var. alt.? fol. patulis, rigidis.—Hab. Tibet, Iskardo, Balti, T. T.

409. Bryum *pseudo-triquetrum*, Hedw.—Hab. Tibet temperata; Turtuk, Shayuk valley, alt. 9,500 ped., T. T.

398. Bryum *strigosum*, Wils. MSS.—Hab. Ceylon, *Gardner.*

404. Bryum *erythrocaulon*, Brid., var.?—Hab. Sikkim-Himalaya alpina; Jongri, alt. 12,000 ped., J. D. H.

394. Bryum *truncorum*, Brid.—Hab. Mont. Nilgiri, *G. Thomson.*

396. Var. fol. suberectis.—Hab. Mont. Khasia temperata; Kollong, alt. 5,000 ped., J. D. H. et T. T.

393. Bryum *Commersoni*, Brid. — HAB. Himalaya occid. trop.; Rampore, Sutlej valley, alt. 3,000 ped., T. T.

395. Bryum (sterile), affine *B. Commersoni*, *B. Zollingeri*, Dub. (C. Müll. ii. 569), et *B. Neelgheriense*, C. Müll. i. 255).—HAB. Himalaya occid. temp.; Kumaon, alt. 6–7,000 ped., T. T.

391, 391 *b*. Bryum *giganteum*, Hook.—HAB. Mont. Khasia temperata; Nonkreem et Myrung, alt. 5,000 ped., J. D. H. et T. T.

397. *Id.*—HAB. Ceylon, *Gardner*.

392, 422, 540. Bryum *spathulatum*, Wils. MSS. (sterile) (*B. roseo* affin.)—HAB. Sikkim-Himalaya temperata, alt. 8–11,000 ped., J. D. H.

660. Mnium *cuspidatum*, Hedw.—HAB. Himalaya occid. temp.; Simla, T. T.

664. Allied to the last (dioic.?) (sterile).—HAB. Himalaya occid. temp.; Simla, alt. 7,000 ped., T. T.

683. *Id.*—HAB. Himalaya occid. temp.; Simla, Mahasu, alt. 7,000 ped., T. T.

644, 645. Mnium *lycopodioides*, Schwægr.—HAB. Sikkim-Himalaya temperata, alt. 8–11,000 ped., J. D. H.

654. Mnium *serratum*, Brid.—HAB. Tibet occid.; Turtuk, Shayuk valley, T. T.

667. (sterile), allied to the last.—HAB. Tibet temperata; Sassar Pass, Nubra, alt. 10–12,000 ped., T. T.

653. Mnium *heterophyllum*, Schwgr.—HAB. Himalaya occid. temp.; Simla, alt. 7,000 ped., T. T.

673, 674, 676. Mnium *punctatum*, Hedw.—HAB. Sikkim-Himalaya temperata, alt. 10–11,000 ped., J. D. H.

671. Mnium *rhyncophorum*, Hook.—HAB. Ceylon, *Gardner*.

666, 668, 669, 675. *Id.* — HAB. Sikkim-Himalaya temperata, alt. 5–10,000 ped., J. D. H.

680, 681. *Id.*—HAB. Himalaya orient. temp.; Nipal, alt. 9,000 ped., J. D. H.

659. *Id.*—HAB. Mont. Khasia subtrop.; Nunklow, alt. 2–4,000 ped., J. D. H. et T. T.

685. *Id.*—Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

662. Mnium *rostratum*, Schwgr. — HAB. Mont. Khasia subtrop.; Churra, alt. 4,000 ped., J. D. H. et T. T.

661. Var.—HAB. Mont. Khasia; Nunklow, J. D. H. et T. T.

665. Var.?—HAB. Himalaya occid. temp.; Chamba, T. T.

679. Mnium *rostratum.*—Hab. Himalaya occid. temp.; Simla, alt. 8,000 ped., T. T.

663. *Id.* — Hab. Tibet occid. temp.; Keris, Shayuk valley, alt. 9,000 ped., T. T.

672. Var.? habitu *M. punctato* subsimilis.—Hab. Sikkim-Himalaya temperata; Ratong river, alt. 11,000 ped., J. D. H.

684. Mnium *rostratum* (absque fruct.). — Hab. Himalaya occid. temp.; Simla, T. T.

665. *Id.*—Hab. Himalaya occid. temp.; Chamba, T. T.

670. Mnium *dilatatum*, Wils. MSS. (*M. cinclidioideo* affine).—Hab. Mont. Khasia temperata; Myrung, alt. 5,000 ped., J. D. H. et T. T.

658. Nov. genus? [*Orthomnion*, Wils. MSS.] *O. crispum*, Wils. MSS. Perist. *Brachymenii*, habitus *Mnii*, capsula ovali subsymmetrica.—Hab. Sikkim-Himalaya temperata; Tonglo, alt. 10,000 ped., J. D. H.

657, 677, 678. *Id.*—Hab. Sikkim-Himalaya temperata; Singalelah, alt. 8–12,000 ped., J. D. H.

656. Orthomnion *trichomitrium*, Wils. MSS. (*Orthodon bryoides*, Griffith).—Hab. Mont. Khasia subtrop., alt. 4,000 ped., J. D. H. et T. T.

686. Timmia *megapolitana*, Hedw.—Tibet occid. temp.; Nubra, alt. 11,000 ped., T. T.

687. *Id.*—Hab. Himalaya occid. temp.; Chamba, alt. 8,000 ped., T. T.

688. *Id.*—Hab. Tibet occid. alp.; Sassar Pass, Nubra, alt. 16–17,000 ped., T. T.

591. Oreas *Martiana*, Brid.—Hab. Sikkim-Himalaya alpina; Momay, alt. 15,500 ped., J. D. H.

571. *Id.*—Hab. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

566. Bartramia *Oederi*, Schwgr. — Hab. Himalaya occid. temp.; Kishtwar, alt. 7,000 ped., T. T.

605. Bartramia *pomiformis*, Hedw., var. *crispa.*—Hab. Himalaya occid. temp.; Chamba, alt. 6–7,000 ped., T. T.

572. Bartramia *Halleriana*, Hedw.—Hab. Sikkim-Himalaya temperata; Lachen, alt. 11,000 ped., J. D. H.

595. Var. fol. latiorib., minus confertis.—Hab. Sikkim-Himalaya temperata; Ratong valley, alt. 8–9,000 ped., J. D. H.

590. *Id.*—Hab. Sikkim-Himalaya temperata; Singalelah, alt. 11,000 ped., J. D. H.

570. Bartramia (Glyphocarpa) *subulata*, Bryol. Eur.—HAB. Sikkim-Himalaya alpina; Kinchin-Jhow, alt. 17,000 ped., J. D. H.

573. Bartramia *leptodonta*, Wils. MSS. (*B. ithyphyllæ* affin.); perist. simple, capsule erect.—HAB. Nipal orient.; Wallanchoon, alt. 10–12,000 ped., J. D. H.

29. Bartramia *breviseta*, Wils. MSS. (allied to *B. arcuata*).—HAB. Mont. Nilgiri, *G. Thomson.*

592. Bartramia *deflexifolia*, Wils. MSS. (*B. arcuatæ* affin.).—HAB. Sikkim-Himalaya alpina; Jongri, alt. 13,000 ped., J. D. H.

588, 589. Bartramia *Hookeri*, Wils. MSS., fol. laxe reticulatis (*B. pendula* diversa), capsula *Bryoidea.*—HAB. Sikkim-Himalaya temperata, alt. 7–9,000 ped., J. D. H.

589. (second paper). Var. fol. brevioribus (caule elongato gracillimo).—HAB. Sikkim-Himalaya temperata, alt. 9,000 ped., J. D. H.

585. Bartramia *Hookeri* (♂ plt.)—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 6,000 ped., J. D. H.

581, 583. Var. fol. falcato-secundis (et planta ♂).—HAB. Sikkim-Himalaya temperata, alt. 4–7,000 ped., J. D. H.

580, 594. Var.? minus (*B. dicranoides*, Wils. MSS.), ♂ plt.—HAB. Sikkim-Himalaya temperata, alt. 6–7,000 ped., J. D. H.

569, 575, 576, 598, 617. Bartramia *Turneriana*, Schwgr.—HAB. Sikkim-Himalaya temperata, alt. 4–7,000 ped., J. D. H.

577. *Id.*—HAB. Sikkim-Himalaya temperata; Chola, alt. 10–12,000 ped., J. D. H.

599. Var. caule gracillimo.—HAB. Sikkim-Himalaya temperata; Lachen, alt. 5,000 ped., J. D. H.

600. *Id.*—HAB. Nipal orient. temp.; Khabili, alt. 6,000 ped., J. D. H.

563, 565. Var. minor.—HAB. Himalaya occid. temp.; Simla mountains, alt. 3,000 ped., T. T.

583, 598. Var. alt.—HAB. Sikkim-Himalaya temperata, alt. 6–7,000 ped., J. D. H.

582. Var. (♂ plt.)—HAB. Sikkim-Himalaya temperata; Chongtam, alt. 6,000 ped., J. D. H.

608. Bartramia *gonioclada*, Wils. MSS. (a var. of *B. Turneriana?*).—HAB. Tibet occid. temp.; Iskardo, Balti, alt. 7,000 ped., T. T.

602. *Id.* (♂ plt.)—HAB. Sikkim-Himalaya temperata, alt. 7,000 ped., J. D. H.

604. Var.? (smaller, barren).—HAB. Himalaya occid. temp.; Simla, alt. 7,000 ped., T. T.

562, 606, 618. Var. of *B. fontana?* (*B. crassinervis*, Wils. MSS.) (*B. calcareæ* affin.)—HAB. Tibet occid. temp; Balti, Rondu, and Iskardo, alt. 6–7,000 ped., T. T.

586. Bartramia *fontana*, Schwgr. (and ♂ plt.)—HAB. Sikkim-Himalaya alpina, alt. 12,000 ped., J. D. H.

587. Var. (♂ plt.)—HAB. Sikkim-Himalaya temperata; Tonglo, alt. 7,000 ped., J. D. H.

567. Var.—HAB. Tibet occid. alp.; Ladak, Subu valley, alt. 13,000 ped., T. T.

564. *Id.*—HAB. Tibet occid. alp.; Piti, Changar, alt. 13,000 ped., T. T.

568. Bartramia *fontana*, var. gracilior. — HAB. Himalaya occid. temp.; Kishtwar, alt. 8,000 ped., T. T.

559. *Id.*—HAB. Tibet occid. temp., alt. 10–12,000 ped., J. D. H.

561. Bartramia *nitida*, Wils. MSS.—HAB. Himalaya occid. temp.; Simla, alt. 7,000 ped., T. T.

579, 584. Bartramia *uncinata*, Schwgr. — HAB. Sikkim-Himalaya temperata, alt. 6–7,000 ped., J. D. H.

Description of a new Species of JOSEPHINIA, *from* Victoria River, N. W. Australia; *by* DR. FERDINAND MUELLER, Colonial Botanist, Melbourne. (With a Plate, Tab. XI.)

Josephinia *Eugeniæ;* annua, pilis articulatis sæpius ramosis papulisque perminutis vestita rariusve tomentosa, foliis vel omnibus trisectis vel superioribus rarius omnibus indivisis, segmentis oblongo- vel ovato-lanceolatis grosse dentatis vel breviter lobatis, calycis laciniis inæqualibus, stigmatis bifidi cruribus indivisis, nucibus echinatis rarius tuberculatis quadriloculatis hispidis vel tomentosis.

HAB. In vallibus fluminis Victoriæ, ejus originem versus, detexit auctor mense Aprile 1856.

Herba subpedalis v. ulnaris, erecta vel diffusa, graveolens. *Radix* recta, fibras tenues producens. *Caulis* obscure quadrangulus. *Folia* ex axillis frequenter innovata, inferiora longe petiolata, cetera petiolo varie longo prædita, summa interdum sessilia, supra parce pilosa,

subtus pilis necnon papulis subglobosis minimis quaternatim cohærentibus obsita; indivisa et segmenta divisorum oblongo- v. ovato-lanceolata acutiuscula v. obtusa in basin cuneatam integerrimam angustata, lateralia terminali 1–2″ longo breviora. *Pedunculi* floriferi 2–3‴, fructiferi ad 4‴ longi, recurvi. *Calycis* laciniæ angusto-lanceolatæ, 1–2‴ longæ, suprema lateralibus minor, inferiores lateralibus paulo majores. *Corolla* basi tubulosa et superne protrusa, sensim subcampanulo-ampliata, rosea, extus puberula, intus basin versus rubropunctata et reticulato-venosa, ad staminum insertionem albo-barbata, ceteroquin intus glabra; lobi labii superioris et lateralis labii inferioris deltoidei vel pæne semiorbiculares; lobus labii inferi medius semiovatus ceteris fere duplo longior. *Stamina* prope basin corollæ inserta, inclusa, didynama; quinti rudimentum minutum. *Filamenta* alba. *Antheræ* sinu baseos affixæ, glandula terminatæ, ante floris perfectam expansionem cordatæ, supra rubræ, subtus albæ, loculis demum angusto-oblongis apice parum basi longius disjunctis flavescentibus nigro-marginatus longitudinaliter dehiscentibus. *Pollinis* granula globosa. *Germen* disco brevi cinctum. *Stylus* cum stigmatis cruribus semiteretibus albus. *Nux* fere ovata, 3–4‴ longa, frequentius spinis subulatis 1–2‴ metientibus, hispidulis, echinata, rarius acute tuberculata. *Semina* erecta, oblonga, loculos omnino explentia, basi truncata, antice angulata, dorso convexa. *Testa* chartacea, fulvida, punctulato-rugulosa. *Albumen* nullum. *Embryo* congenerum.

Plantarum generis præaugustissimæ Josephinæ sacrati speciem hancce novam et quam maxime insignem summa cum observantia serenissimæ Eugeniæ, Franco-gallorum Imperatrici, botanicen quoque inter scientias et artes benigne foventi, consecrare audeo.

Explicatio Tabulæ.—1. *Pili* valde aucti. 2. *Corolla* parum aucta. 3. *Corolla* longitudinaliter fissa, expansa, modice aucta. 4. *Antheræ* multoties auctæ, antice et postice visæ. 5. *Germen* disco cinctum, conspicue auctum. 6. *Nux* aliquoties aucta, transverse et 7 eadem longitudinaliter secta. 8. *Semen* pluries auctum. 9. Idem longitudinaliter fissum.

Scripsi in horto botanico Melbournensi, Idibus Junii 1857.

Dr. Ferdinandus Mueller,

Guberni Coloniæ Victoriæ Phytologus.

On a new Species of Diapensia, *from the* Eastern Himalaya; *by* J. D. Hooker, M.D., F.R.S, etc. (With a Plate, Tab. XII.)

Of the genus *Diapensia* only one species, *D. Lapponica,* (or two, if the *Pyxidanthera barbulata* be included,) have hitherto been described. The *Pyxidanthera* is a native of the north-eastern United States of America. The *D. Lapponica* is a much more widely distributed plant, being common in the Arctic regions of Europe, Asia, and America, attaining the seventh parallel, and also occurring on the alps of Scandinavia, and at an elevation of 4500–6500 feet in the White Mountains of New Hampshire.

The species now to be described is the only Central Asiatic representative of the genus, and is apparently a very local Himalayan plant, occurring nowhere to the westward of the longitude of Sikkim, where it is seen on wet rocks and banks in the humid subalpine valleys, at elevations of 10–14,000 feet; it does not however inhabit either the outer ranges or the drier interior valleys. In its native state it so entirely resembles a *Primula* in its flower, that Linnæus's having assigned it a place in the same Natural Order (*Preciales*) with most of the *Primulaceæ*, was a very natural error. The true affinities of the genus are however no doubt with *Ericeæ*. In habit and foliage *D. Lapponica* and *Himalaica* very much resemble *Loiseleuria procumbens*, and in the structure of their flowers they are still more closely allied to the Himalayan genus *Diplarche*, described and figured at vol. vi. p. 382. t. 11 of this work, and referred to the tribe *Rhodoreæ* of *Ericeæ*. To that tribe I would append *Diapensia*, the only point of difference appearing to be the absence of a hypogynous disc, and the insertion of the stamens at the mouth of the corolla instead of towards its base; in this latter respect the stamens represent the upper series in *Diplarche*, which are inserted above the middle of the tube of the corolla. The other points of affinity between *Diapensia* and *Ericeæ* have been dwelt upon by various botanists, and including, as they do, the whole structure of the ovary and ovules, carpels and placentation, albumen and embryo, they are of themselves almost sufficient to establish its place in the Natural System. Amongst the less important points of difference between *Diapensia* and the tribe *Rhodoreæ* are the absence of any indusium, or thickened termination of the cuticle surrounding the stigmatic surfaces, the petaloid or broad filaments, and the divaricating anthers. In the 'Flora Antarctica,' vol. ii. p. 332, I have alluded

W Fitch del et lith.

Vincent Brooks Imp

Diapensia Himalaica, *H.f.&T.*

to M. Planchon's having pointed out certain affinities between *Diapensia* and the South American genus *Desfontainea*, but at that time the fruit of *Desfontainea* was unknown; it has since been described by Bentham (Linn. Soc. Journ. vol. i. p. 97), and referred by him to *Loganiaceæ*.

1. Diapensia *Himalaica* (Hook. fil. et Thoms.); foliis lineari-spathulatis subacutis, floribus sessilibus, tubo corollæ calyce duplo longiore, lobis amplis late obovatis, filamentis obovato-quadratis, loculis antherarum divergentibus, pedunculo fructifero elongato.

HAB. Himalaya orient. subalpina; Sikkim rupibus madidis, alt. 10–14,000 ped.—(Fl. May, June.) (*v. v.*)

Caules prostrati, dense cæspitosi. *Folia* coriacea, $\frac{1}{4}$–$\frac{1}{3}$ unc. longa, subnitida, marginibus recurvis. *Flores* $\frac{1}{2}$–$\frac{2}{3}$ unc. lati, purpureo-rosei.

TAB. XII. Fig. 1. Leaf. 2. Flower. 3. Corolla, laid open. 4. Stamen. 5. Pistil. 6. Transverse section of ovary. 7. Capsule:—*all magnified.*

BOTANICAL INFORMATION.

DR. NYLANDER'S *Synopsis of the* LICHENS.

Le soussigné a l'intention de mettre sous presse cet hiver un 'Synopsis Général des Licheus,' pour lequel il a depuis plusieurs années réuni les matériaux. L'occasion d'étudier les riches collections d'Acharius, du Muséum de Paris, de Messrs. Hooker, Fée, Lenormand, Thuret et d'autres, dans lesquelles se trouve réuni un nombre immense de ces végétaux, m'a fourni les éléments du travail que je suis prêt à publier sur les Lichens de tout le globe. Ce travail sera précédé d'une introduction en Français, contenant leur organographie et divers chapitres sur leur distribution géographique, usages, etc. La partie descriptive est écrit en Latin, avec des définitions concises, mais suffisantes, pour chaque espèce. La classification suivie est celle qui m'est propre et qui se distingue surtout des autres en ce que les *spermogonies* y ont pris rang parmi les caractères de première importance. Le tout formera un volume in-8vo, accompagné de 30 planches analytiques, et paraîtra dans 4 livraisons et dans l'espace d'un an. Le prix de chaque livraison sera environ 7 shill.

Kew, November, 1857. W. NYLANDER, *Med. Dr.*

Herbarium Græcum Normale.

M. Th. de Heldreich, Directeur du Jardin Botanique d'Athènes, connu des botanistes par les importantes collections de plantes qu'il a recueillies en Asie Mineure et en Grèce, publie en ce moment un intéressant 'Herbarium Græcum Normale,' dont le but principal est de répandre dans les herbiers les types des plantes figurées ou décrites dans la Flora Græca de Sibthorp et Smith, dans la Flore du Péloponnèse de Bory et Chambard, et dans le Diagnoses Plantarum Orientalium de M. Boissier, etc. La publication comprend déjà six centuries qui se font remarquer non seulement par le choix des espèces et la beauté des échantillons, mais encore par le soin avec lequel sont dressées les étiquettes munies de numéros d'ordre et indiquant avec exactitude tous les synonymes importants. L'auteur de l'Herbarium Græcum Normale s'occupe toujours activement de poursuivre son œuvre, et cette année une nouvelle exploration du Mont Parnasse et du Mont Velachi (Thymphresta des anciens) enrichira les prochaines centuries d'un grand nombre d'espèces intéressantes. Le prix de l'Herbarium Græcum Normale est de 25 frs. par centurie.

M. de Heldreich offre également aux botanistes une centurie de plantes rares de l'Égypte inférieure, au prix de 28 frs.

Le représentant de M. de Heldreich à Paris est M. Kralik, 12, Rue du Grand Chantier.

Death of Mr. Purdie.

Governor Keate, of Trinidad, has just communicated to us a notice of the death of Mr. William Purdie,—for some years past the active and intelligent Superintendent of the Botanic Garden of Trinidad. He received his horticultural and botanical education mainly at the Royal Gardens of Kew; and on account of his zeal and abilities was sent out on a mission to Jamaica and New Granada, where he justified the good opinion that was entertained of him, by sending home very considerable collections of plants (living and dried), and seeds, etc. Among the more important thus introduced to our stoves are the Wax-Palm (*Ceroxylon Andicola*, Humb.), and the equally rare Ivory-Palm (*Phytelephas macrocarpa*, Ruiz and Pavon). While he was still engaged on this mission, Lord Harris sought and obtained his services for the Garden at Trinidad, on the death of Mr. Lockhart, a position

he filled to the great satisfaction of the respective Governors. His name stands commemorated in the genus *Purdiæa*, a very handsome Ericaceous plant, and one of his own discoveries,—figured and described by Professor Planchon, in the 'London Journal of Botany,' vol. v. p. 250, tab. 9.

Mr. Thwaites's Enumeration of the Plants of Ceylon.

Under the above title we are happy to inform the botanical world that Mr. Thwaites is preparing materials, which we have reason to believe will very soon be published, on the plants of Ceylon, giving a correct list of all the hitherto discovered species, together with generic or specific characters of such as are new. We are ourselves the more gratified at this, because our Journal, where Mr. Thwaites has been so long accustomed to announce his many new discoveries, often accompanied by excellent figures as well as descriptions, will henceforth be discontinued. In Mr. Thwaites, of the Ceylon Garden, and in Dr. Mueller, of the Government Botanic Garden at Melbourne, we see the advantages arising from appointing well-educated and scientific men to the head of these Colonial Establishments, men too as willing as they are able to undertake a 'Flora' of their respective colonies, and to develope their vegetable resources. We can mention another step in a right direction, in the filling up a vacancy of this kind in Trinidad, occasioned by the recent death of Mr. Purdie. The choice of his Excellency Governor Keate has fallen upon Dr. Kruger, a gentleman long resident in that island, of considerable scientific attainments, and well acquainted with tropical botany.

In the case of Mr. Thwaites, he has the tact for encouraging a taste for scientific pursuits in those about him. Hence it has happened that Ceylon was so well represented in its vegetable products at the Great Paris Exhibition of 1855; and hence it is that the museum of the Royal Gardens of Kew has been so much enriched, especially with woods and fibres, etc., of that Island, from Samuel Jayeteleke, Esq., Modliar. Already 216 kinds of woods, neatly prepared, have been received from this obliging gentleman, and a still finer set is on its way, accompanied by specimens of the plants that afford them. Such a man is a real honour to his country, and is rendering great service both to the cause of science and of commerce.

NOTICES OF BOOKS.

Reports on the BOTANY *of the Expeditions and Surveys for a Railroad route from the* MISSISSIPPI RIVER *to the* PACIFIC OCEAN. War Department, U.S.A. :—

1. *Route on the Forty-first Parallel of North Latitude, under the command of* LIEUTENANT E. G. BECKWITH, Third Artillery; *by* JOHN TORREY *and* ASA GRAY. 4to, Eight Plates. (*Published January* 7, 1857.)
2. *Route near the Thirty-eighth and Thirty-ninth Parallels of North Latitude, under the command of* CAPTAIN J. W. GUNNISON, Corps of Topographical Engineers; *by* JOHN TORREY *and* ASA GRAY. 4to, Two Plates. (*Published January* 7, 1857.)
3. *Route near the Thirty-second Parallel of North Latitude, under the command of* CAPTAIN JOHN POPE, Corps of Topographical Engineers; *by* JOHN TORREY *and* ASA GRAY. 4to, Ten Plates.
4. *Route near the Thirty-fifth Parallel, Explored by* LIEUTENANT A. W. WHIPPLE, Topographical Engineers, in 1853 and 1854; *by* JOHN TORREY *and* ASA GRAY. 4to, Ten Plates.
5. *Same Route as No.* 4, MOSSES *and* HEPATICÆ; *by* W. S. SULLIVANT. 4to, Ten Plates.

These five distinct articles include a portion of the valuable results arising from the laudable conduct of the American Government, in having required that scientific men should be attached to the Explorations they have carried out with the view to the discovery of the best railway route from the Mississippi River to the Pacific Ocean; and the materials of these botanical collections have been placed in the hands of naturalists eminently calculated to do them justice.

1. The first noticed on the above list describes the collections made by James A. Snyder, in an expedition from Great Salt Lake, Utah territory, directly west to the Sacramento Valley, in California, in the months of May, June, and July, 1854; it contains only 59 species, of which 9 are new.

2. Plants collected by Mr. F. Creutzfeldt, on an expedition by the way of the Kansas and Arkansas Rivers to Rent's Fort; thence by Huerfano River and Sangre de Cristo Pass to the valley of San Luis; thence west from that valley to Grand and Green Rivers; thence into

the Great Basin Utah, to the vicinity of the Sevier or Nicollet Lake. The collection was commenced at Westport, in Missouri, in June, 1853, and finished late in October, and contains 125 species, of which 2 appear to be new, together with a doubtful Pine.

3. Route near the thirty-second parallel of north latitude, under the command of Captain John Pope; the exact route not noticed, nor the name of the collector; it affords a catalogue of 213 species, of which 14 are described as new, and 4 constitute so many new genera. The drawings of the plates by Sprague are particularly beautiful.

4. Of the botanical report of this route (near the thirty-fifth parallel) we have received, at present, no letter-press, but Dr. Torrey has favoured us with a series of plates, preparing for the illustration of this Report, of which the following only bear names:—*Crossocoma Californica*, *Thamnosma montanum*, *Whipplæa modesta*, *Hofmeisteria pluriseta*, *Linosyris Bigelovii*, *Stylocline gnaphalioides*, *Calais Bigelovii* and *Calais tenella*, *Calais cyclocarpha*, *Eriogonum lachnygonum*, *Obione hymenolyra*, *Alisma Californica*, *Corallorhiza striata*, *Stropholirion Californicum*. This is probably a richer collection than was found during any of the preceding routes.

5. The last of these articles contains the *Musci* and *Hepaticæ* of the Route No. 4, by a gentleman every way as competent in these Natural Families as Drs. Torrey and Gray are in general phænogamic botany, W. S. Sullivant, Esq.; drawn in a very masterly style by Messrs. Sullivant and A. Schrader. The two Orders embrace 68 species, 11 of which are new, and figured with admirable analyses, on ten plates; these are all European genera, and very much European forms.

A Manual FLORA *of* MADEIRA *and the adjacent Islands of* Porto Santo *and the* Dezertas; *by the* REV. RICHARD THOMAS LOWE, M.A. 8vo. Van Voorst. 1857.

This is the first instalment of a Work on the Flora of the Madeiras, which, if carried through in the manner in which the present part has been executed, will be not only a most useful manual for local inquirers, but a very valuable contribution to general botany. It is well known that Mr. Lowe has been at work for a long time on the botany of these islands. Indeed, as nearly twenty-seven years have elapsed since he

first publicly announced his intention of issuing a Prodromus, botanists began to despair of seeing anything but fragmentary papers from his pen; and now, as he presents us with the first portion of his work, we regret to find him speaking of a suspension of his labours being enforced by the state of his health.

This portion of the Work embraces the Subclass *Thalamifloræ*, with 21 Orders, 63 genera, and 131 species, and forms about one-sixth of the whole, if restricted to the Phænogamous Flora. Only one large Order, the *Cruciferæ*, falls into this Subclass; the other large Orders, the *Leguminosæ*, *Compositæ*, *Labiatæ*, *Scrophularineæ*, and *Umbelliferæ*, remain undealt with. Of the 131 species here described, about 30 are mere escapes from cultivation, and form, strictly speaking, no part of the Flora of Madeira. Amongst them are the Vine, the Orange-tree, Lemon-tree, and Citron-tree, with various *Pelargonia* and *Oxalises*. Of the remaining species, though truly indigenous, as far as can now be ascertained, the majority are European, but some seventeen belong to the Macronesian Flora, as Mr. Webb styled the flora of the islands of the northern Atlantic, and of these nine are peculiar to Madeira. In this last category we find *Berberis Maderensis*, Lowe, *Matthiola Maderensis*, Lowe, *Cheiranthus tenuifolius*, L'Hér., *C. Arbuscula*, Lowe, *Sinapidendron frutescens*, Lowe, *S. angustifolium*, Lowe, *S. rupestre*, Lowe, *Crambe fruticosa*, L. fil., and *Viola paradoxa*, Lowe. It would have been well, we think, in the case of plants which are natives of more than one of the North Atlantic groups, including the Madeiras, to have indicated the fact distinctly under each; thus, whilst only a single one of those here described (viz. *Hypericum grandifolium*, Chois.), appears to have been met with at all the three groups of the Madeiras, Azores, and Canaries; and only two, viz. *Ranunculus grandifolius*, Lowe, and *Cerastium vagans*, Lowe (with which latter we take *C. Azoricum*, Hochst., to be identical), are common to the Azores and Madeira, not being found elsewhere; there are five, viz. *Cheiranthus mutabilis*, L'Hér., *Hypericum floribundum*, Ait., *H. glandulosum*, Ait., *Geranium anemonifolium*, L'Hér., and *Pittosporum coriaceum*, Ait., which are common to the Canaries and Madeira, and confined to them. As to the last-mentioned tree, although it has not been met with of late, yet as Mr. Webb says distinctly that he once discovered a specimen of it, we are disposed to think he could hardly be mistaken. He adds, "Occurrit unicum hoc generis specimen in Teneriffâ et Maderâ, unde priscæ

Atlantidis, si fabula non ficta, floræ vetus erat hospes." Mr. Lowe appears not to have seen the seeds of this very rare tree; they are large, bony, and of a dark brown colour, enveloped in resinous juice, and disposed in four series in the coriaceous capsule, which is normally two-valved. The embryo is imbedded in copious, hard albumen. He describes the capsule from Masson's original plants in the Banksian Herbarium, as "curiously vermiculato-verruculate or sinuato-rugulose;" perhaps this sculpturing was effected by insects, for we have seen nothing like it on the fresh fruit. The seeds are ripe about March, when the tree is putting out another year's flowers. An infusion of the pounded seeds, it may be noted, is used by the peasantry as a "remedio."—*J. Y. J.*

The London Catalogue of BRITISH PLANTS. *Published under the direction of the Botanical Society of London; adapted for marking Desiderata in Exchanges of Specimens, etc.* Fifth Edition. London: W. Pamplin. 1857.

The late "London Botanical Society" has done great service to British Botany, by the close attention paid by its members, and especially by Messrs. H. C. Watson and Syme, to the correct nomenclature of the genera and species, and by its extensive distribution of species with authentic names. To explain the appearance of a new edition (the fifth) of their Catalogue "during the state of abeyance of the Botanical Society, pending arrangements for its active resuscitation," the Editor observes that, the copyright having been in the meantime "vested in the editors of the fourth edition, namely Messrs. H. C. Watson and J. T. Syme," they have deemed it proper to meet the call for another edition. However therefore science may be a loser by the temporary dissolution of the Society, the public loses nothing of the services of the able editors.

A printed page on the wrapper explains the alterations that have been made in this edition. In order to keep the Catalogue within the compass of a folded sheet, few *varieties* have been retained in the list, except those distinguished by characters sufficiently marked to have led some botanists to retain them as true species. The nomenclature in the genera *Salix*, *Rubus*, *Rosa*, *Chara*, *Arctium*, and *Ranunculus* (partly), has been adapted to that of Babington's 'Manual of Botany,' fourth edition, "for the sake of uniformity in labelling specimens

during the present unsettled opinions about the limits of the species,"—we hope, however, not in opposition to the views of the editors. The list of genera and species and varieties of *Salix* is chiefly derived from the Rev. J. E. Leafe's writings, as is that of the species of *Hieracium* from Mr. Backhouse's 'Monograph.' The page concludes with other observations needful to those who use the Catalogue; and at the end of the 1444 considered legitimate species, is given one of "Excluded species;" such as are—1, occasionally found wild through cultivation, on ballast, etc.; 2, not distinctly ascertained in Britain, or ambiguous plants otherwise; and, 3, erroneously recorded, or subsequently extinct in Britain. The whole is evidently executed with care and fidelity.

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1. Schott, H.: Aroideæ. Fasc. III.–VI., each with Ten Plates. Large folio. Vienna, 1855–7.
2. Schott, H.: Icones Aroidearum. Large folio. Fasc. I., with Ten coloured Plates. Vienna, 1857.

We noticed in our Volume VII., for 1855, fasciculi 1 and 2 of the first of the above two works with great commendation, and expressed a hope that "nothing would occur to impede the progress of the work, that was alike creditable to the author and the artist." And certainly, considering the amount of time and labour required in the conducting such a publication, no one can complain on that score, for we have now the great pleasure of receiving the fasciculi 3–6.

The letter-press here issued commences with the genus *Theriophonum*, Bl., of which the *Arum crenatum*, Wight, is the representative, and there is only another (dubious) species, *T. Dalzellii* of Schott. *Eminium* of Blume reckons 5 species: *Dracunculus*, 2; *Helicodiceros* (*Arum crinitum*, Ait.), 1; *Helicophyllum*, Schott, 3 species. *Pothos* is limited to that group of which *P. scandens*, Linn., is the type, and 30 species, bearing, we fear, too great a resemblance to each other, are enumerated. *Pothoideum*, Schott, is a new genus of a single species from Manilla, in Herb. Hook. *Heteropsis*, Kth., is a Brazilian genus of 3 species. The plates that accompany the descriptions are beautifully executed, and are all that can be desired both in execution and analysis.

The second work, of which the title heads this article, 'Icones Aroidearum edit. a H. Schott,' is the first fasciculus of a new publication,

as it appears, to consist of highly coloured figures, entirely done from *living* plants, of which it is well known that Dr. Schott has a very large collection under his superintending care. It is quite an "ouvrage de luxe," of which the text has not yet appeared. The first ten plates are devoted to the analysis and illustration of two species, viz. *Philodendron eximium*, of Schott, and *Philodendron speciosum*, Schott, illustrative of the botanical structure, the internal organization, and the germination. The noble forms of many of these Aroideous plants renders them highly deserving of cultivation; indeed, it is extremely difficult to possess a correct knowledge of the individuals of this family but by studying them from the living specimens: hence the great importance of a work of this kind, to which we wish every success.

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1. *The* PHYTOLOGIST, *a* Botanical Journal; *edited by* ALEXANDER IRVINE. 8vo. 1855–57. New Series. London: Pamplin.
2. A BOTANICAL TOUR *in the Highlands of* PERTHSHIRE; *by* W. P. *and* A. I. (*reprinted from the* 'Phytologist'). London: Pamplin.

We noticed with commendation the commencement of the first of these two works in the seventh volume of our Miscellany, p. 219, and we are glad to see the same good spirit pervading the pages of the continuation, which form so striking a contrast with its predecessor of the same title. "The sole journal devoted to the knowledge and progress of British Botany has a higher aim than that of a fault-finder or caviller," as is truly observed in the latest number, now before us, No. 30, New Series.

Its contents are too varied to allow of our directing attention to any particular subject treated. The object in view is stated to be, that of supplying the botanist with a record of the progress of British Botany, —"1, by publishing accounts or notes of botanical tours; 2, by a series of articles on the *habitats* and the range, both horizontal and altitudinal, of the British species, *e.g.* as annuals, biennials, and perennials, times of flowering, maturation, and such-like; 3, notes on critical plants, varieties, newly-observed localities, etc. etc.; 4, articles on nomenclature, scientific and popular names, and classification; 5, abstracts of the progress of botany during the month; 6, current intelligence, notices of publications, reviews, etc.; 7, proceedings of societies; 8, botanical notes and queries, with replies to the latter." This

pledge is correctly fulfilled, and the respectable list of contributors shows the interest that British botanists especially feel in its success.

The Botanical Tours are not among the least interesting portions of the 'Phytologist,' and our second article at the head of this notice forms a separate little volume of seventy-five pages, reprinted and sold separately from that work. It has moreover a dedication "to the friends and supporters of the 'Phytologist,'" a preface, and a full index of the names of places, and of the rarer plants. The several chapters treat of the most beautiful districts of the Scottish Highlands, and carry the mind of the reader among the choicest vegetable productions of that alpine region.

As the 'Phytologist' is now conducted, it cannot fail to foster and to increase the taste for British botany.

Moore's Index Filicum.

Having described the plan and usefulness of this work in our recent numbers of the Journal, we allude to it here chiefly for the sake of remarking that the indefatigable author issues the parts as rapidly as the very laborious task he has undertaken will allow. The fourth has recently appeared, comprising the genera *Adiantum*, L. (commencing with the species *denticulatum*, Burm.), to which nearly twenty closely-printed pages are devoted, *Aglaomorpha*, Schott, *Alcicornium*, Gaud., *Aleuritopteris*, Fée, *Allantodia*, Br. (here reduced to *A. Brunoniana*, Wall.), *Alloesthes*, M. (now abolished), *Allosorus*, Bernh. (here confined to the European form, to ? *robustus*, Kze., of South Africa, and to *Allosorus Stelleri*, Rupr., of Siberia, to which is referred the *Pteris gracilis* of Mich., on the authority, we believe, of specimens from Dr. Ruprecht himself), *Allothecium* (now referred to *Pleopeltis*), *Alsophila*, R. Br., occupying nearly fourteen pages, *Amauropelta*, Kze., *Amblia*, Pr., *Amesium*, Newm., *Amelopteris*, Kze., *Ampelopteris*, Kl. (*Tæniopsis*, Auctt.), *Amphiblestra*, Pr., *Amphicosmia*, Gardn. (to which many species are referred from other Cyatheaceous Ferns), *Amphidesmium*, Schott, *Amphipterum*, Pr., *Amphoradenium*, Desv., *Anapausia*, Pr., *Anapeltis*, J. Sm., *Anaxetum*, Schott, *Anchistea*, Pr., *Anemia*, Sw., *Anemirhiza*, J. Sm. (restored to *Anemia*), *Anemidictyon*, J. Sm., and *Anetium*, Splitz.

The genera and species here adopted and now elaborated, commencing with *Abacopteris*, and concluding with *Anetium* (alphabetically arranged), include seventeen of the former, and 344 of the latter. This

may give some notion of the labour yet to come, as well as past, and for which Mr. Moore deserves the thanks of all students and cultivators of Ferns.

Note of the Editor.

The Editor of this Journal (or rather the last of a series of Journals) cannot bring it to a close, as he does with this present number, without thanking heartily the many friends, not a few among the most distinguished of botanists and men of science, for their numerous and valued contributions, continued during a period of thirty years. It is that length of time, namely in 1827, that, indulging in an extensive correspondence with botanists and travellers abroad, and possessing in his own, even then, extensive herbarium, many novelties which he could not wish to lie useless, unknown to science and to fame, in the Hortus Siccus, he formed the idea of publishing the "Botanical Miscellany; *containing figures and descriptions of such plants as recommend themselves by their novelty, rarity, or history, or by the uses to which they are applied in the arts, in medicine, and in domestic economy; together with botanical notices and information.*" The work was undertaken by Mr. Murray, and extended to three large octavo volumes, with 153 plates, many of them coloured.

This form, and with such plates, not a few in quarto, was too expensive, both for the publisher and the author; and in 1834 Messrs. Longman engaged to publish a continuation, in an altered (smaller and cheaper) form, under the slightly modified title of "The Journal of Botany, *being a second series of the* Botanical Miscellany," etc.

After the appearance of vol. i. of this Journal, with thirty plates, it seemed more eligible to the Editor that he should undertake to conduct the botanical portion of 'Taylor's Annals of Natural History,' which he did for two years. But he considered the mixing up botany with zoology objectionable, requiring, as it did, that the botanist should purchase the zoology of the 'Annals,' and *vice versâ;* so that he again reverted to the "Journal of Botany," and carried out three more volumes, with thirty-seven plates, entirely however at his own cost; so that it may be supposed his expenses were heavy, while his profits were, as before and since, as he always anticipated, literally *nil.*

An opportunity however occurred, in the year 1838, of carrying on

the same kind of Journal precisely, accompanying, and as supplementary to, the numbers of the 'Botanical Magazine;' and this continued, and in such a form as to be bound up separately from that work (and copies were also sold separately), under the title of 'COMPANION TO THE BOTANICAL MAGAZINE,' in two volumes, large octavo, with thirty-two plates.

All these were conducted during the time the Editor held the Chair of Botany in the University of Glasgow. On his removal to the Royal Gardens of Kew in 1841, where he maintained a still more extensive correspondence, and had greater facilities for obtaining information from all parts of the world, Mr. Baillière suggested the propriety of editing a journal which should more immediately emanate from the Metropolis of the kingdom, and consequently from the head-quarters of science; and "THE LONDON JOURNAL OF BOTANY; *containing figures and descriptions of such plants as recommend themselves by their novelty, rarity, history, or uses; together with botanical notices and information, and occasional portraits and memoirs of eminent botanists*," was the result. This, extending to seven volumes, each of nearly 700 pages, and illustrated with 168 plates, was continued till 1848, when Mr. Lovell Reeve undertook to carry it on under the altered title (seeing it was likely to include a great deal of information respecting Kew Gardens, and its "Museum of Vegetable Products") of "JOURNAL OF BOTANY AND KEW GARDEN MISCELLANY," which now closes with the Ninth Volume, and 108 Plates.

Could this now extensive publication, or any portion of it, have been of a sufficiently *popular* character to have encouraged the publisher to remunerate a competent Editor, or even some of the Contributors, there is no doubt it would have been better worth the attention of the scientific world. For its many deficiencies the voluntary Editor is alone responsible. He is not blind to them himself; and could he see as others see them, a still more unfavourable opinion would be the result. It has however been productive to him of a most interesting correspondence with men of science and travellers of every grade and in every clime (many of them now numbered with the dead), and which, towards the close of a long life devoted to the prosecution and promotion of botanical knowledge, he cannot but reflect upon with satisfaction and with gratitude.

Royal Gardens, Kew, December 1, 1857.